A TREATISE ON THE PRINCIPAL DISEASES OF THE EYES.

BY

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ILLUSTRATED BY ENGRAVINGS.

TRANSLATED FROM THE ITALIAN,

WITH NOTES,

BY JAMES BRIGGS,

SURGEON TO THE PUBLIC DISPENSARY.

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CONSIDERABLY ENLARGED.

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SENIOR SURGEON TO THE LOCK HOSPITAL,

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&c. &c.

THIS WORK

IS INSCRIBED BY

THE TRANSLATOR.

THE

TRANSLATOR'S PREFACE.

THE comparatively slow advancement of surgery, in common with that of medicine, is principally to be attributed to the great diversity and extent of the facts upon which it is founded, and to their irregular and uncertain occurrence. But, independently of these obstacles to its improvement, which are naturally inseparable from the study of it, the slow progress of this department of the healing art would seem, in no inconsiderable degree, to be owing to an imperfection in the manner of cultivating it; by surgeons either limiting their observations to the diseases of some particular part of the body, or by directing their sole attention to some particular disease.

Those who have applied themselves to the study of diseases of the eye, have too fre-

quently confined themselves to the mere consideration of such affections, without any regard to the knowledge of diseases generally; as if the disorders of the eye had something in their nature totally distinct from those of other parts; or, as if there were no analogy between similar diseases affecting different parts of the body.

It has been frequently imagined likewise, that the operations which are performed upon the eye require greater skill or dexterity, than those which are executed upon other parts of the body. And it has been rather upon some imaginary improvement in the methods of operating, than upon any acknowledged peculiarity in the nature of the diseases which affect this organ, that those who have termed themselves oculists, have generally rested their pretensions. Whether there be, however, any greater difficulty in these operations than in those which are executed upon the body generally, those who have had the most extensive opportunities of performing both, are best able to determine. It ought also to be recollected, that the term dexterity can scarcely be applied with propriety to surgical operations, in the same sense in which it is employed in the mechanic arts; the success of an operation depending more upon a distinct knowledge of what ought to be

done, than upon any adroitness in the performance of it.

The custom of considering the diseases of the eye as a distinct province of the healing art, and of confining the study of them to a few individuals, appears to be no less unfounded in nature than prejudicial to the general advancement of surgery. Nor can any thing analogous to this be discovered in the other departments of science, the principles upon which they are formed being drawn from the most comprehensive view of the objects which they embrace. If, indeed, we take a view of the improvements which have been introduced into this branch of surgery, we shall find, that they have been almost exclusively confined to those who, with extensive opportunities of investigating the morbid affections of the eye, have united an enlarged knowledge of other diseases. And it is to this application of the general principles of surgery, and to a more correct anatomy, both of the natural and disordered state of this organ, than has been hitherto attained, that the greater part of the discoveries contained in this Work are to be attributed.

In attempting, therefore, to render the writings of an author more generally known, who

has so largely contributed to extend our knowledge of the diseases of the eye, and to establish the treatment of them upon more rational principles, the translator is unwilling to believe, that any apology is necessary, or that his labour has been useless or misapplied. His principal solicitude in the execution of it, has been to render it as close an imitation of the original as the genius of the two languages would admit, preferring, wherever it could be adopted, a literal to a liberal translation.

The *original* Work has passed through several Editions without receiving any corrections from the hand of the Author, from its first impression in 1801, until the present time. The experience of sixteen years has enabled him to multiply his observations on most of the subjects treated of in it, to rectify some opinions, and to enlarge it by the addition of much new and valuable matter.

The alterations are indeed so numerous and considerable, that they occur not only in almost every chapter, but in almost every page of it. On this account it has been necessary, in editing a new Edition of the Translation, to compare the Work, as it is now printed, accurately word by word with the first Italian copy. In doing this, it has been impossible, in

a great degree, to avoid a revision of the former translation of it, in which the writer has found but too frequent occasions for amendment.

Various additional Notes have been also introduced by the Translator, chiefly of a practical nature, which his own opportunities of observation or reading have enabled him to make since the first impression of it.

On all these accounts, the present Edition will be found to differ materially from the former; and he indulges a hope, that it will be found less imperfect and less unworthy of its original than before.

Edgware Road,
February 7, 1818.

THE

AUTHOR'S PREFACE

TO THE

FIFTH EDITION.

IN the practice of surgery, I have been uniformly in the habit of comparing my own observations with those of the most eminent writers of every age; and I have been frequently gratified to find, in their writings, facts and observations which my own experience confirmed. It was only on the diseases of the eyes that, in a very considerable number of cases and variety of circumstances, the results of my practice did not accord with their fair promises and specious instructions, by following which, I was very frequently disappointed of the success which I had expected. It has appeared to me, also, that the greater part of modern surgeons, who have written complete systems of surgery, or treatises on the diseases of the eyes, have rather employed themselves in collecting

a number of formulæ of internal and external remedies, or in minutely detailing all the methods of operating which have been proposed for the cure of those diseases, than in determining, from observation and experience, which of the numerous remedies and various modes of operating ought to have the preference. Professed oculists, who have entirely devoted themselves to this department of surgery, from whom great and important improvements might justly have been expected, in consequence of their not being sufficiently versed in all the other parts of surgery, have, on the contrary, only contributed theories, which have been disproved by a minute anatomical investigation of the eye, or have amused us only with histories of cures little less than miraculous. And it is to be regretted, that, even in the present day, some who have been regularly educated in surgery, no sooner aspire to the celebrity of oculists, than they immediately attach themselves to the marvellous, and cannot be withheld from inserting in their writings traits less characteristic of the surgeon than of the empiric; than which nothing can be more injurious to the welfare of mankind, to the advancement of surgery, and to the character of him who practises it. For these inconsiderate promises are

readily embraced by the young and inexperienced, who, ignorant of the many, and sometimes insuperable difficulties which they have to encounter, proceed with ardour and intrepidity, and in the end embarrass themselves, to the prejudice of their own reputation and the safety of others.

The following Treatise, therefore, which is the result of my own practice and experience, has been published with a view to separate from this important branch of surgery whatever is untrue or exaggerated, and to assist the young surgeon in the treatment of the more important diseases of the eyes, not only by a selection of the most efficacious internal and external remedies hitherto known, but of the most simple and useful methods of operating. Divested of all prejudice, and having frequent opportunities of employing the most approved remedies, and the various modes of operating which have been hitherto proposed for the cure of those diseases, which affect the organ of vision, I have been enabled to ascertain fully the utility of some of these methods of treatment, and the inefficacy or imperfection of others, though equally extolled; and on these points, therefore, I am authorized to pronounce definitively.

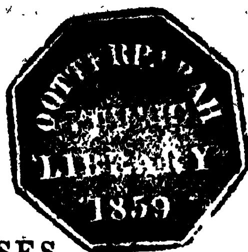
In order to render the methods of operating

more intelligible to the young surgeon, I have thought it proper to add to the greater part of the chapters contained in the work, the details of some practical cases; expressly selecting from the great number, which I might have adduced, the histories of such as have been registered in my School of Clinical Surgery, in the presence of a great number of pupils. In the healing art, precepts without examples are for the most part abstruse and obscure, and examples without precepts generally uninteresting. I entertain, therefore, the fullest confidence, that whoever will exactly follow the plan of treatment which I have laid down, whether with respect to the external and internal remedies, or the manual operations, will not only find what I have advanced to be easily understood and executed, but also that the event will generally, if not always, accord with what I have asserted; which, in the medical art, is the most that can be promised.

To this Edition, which has been enlarged by numerous illustrations upon nearly all the subjects contained in the Work, I have added several important anatomico-pathological and practical observations, lately published by men of undoubted credit, and skilled in all the branches of surgery; as well as some chapters which had

been either partly or altogether omitted in the preceding editions of it, viz.: on the ARTIFICIAL PUPIL; FUNGUS HÆMATODES, AND CANCER OF THE EYE; AND ON THE ENCYSTED TUMOR FORMED IN THE CAVITY OF THE ORBIT. Some additional figures have also been introduced into the plates, of which some are designed to convey a knowledge of one of the most formidable of all the diseases affecting the eyeball; others to remove all doubt with regard to the operation for the Fistula Lachrymalis and that of the Artificial Pupil.

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ON THE

PRINCIPAL DISEASES

OF THE

EYES.

CHAP. I.

OF THE PURIFORM DISCHARGE OF THE PALPEBRÆ, AND OF THE FISTULA LACHRYMALIS.

SURGEONS are generally agreed that a *fistula lachrymalis* exists, whenever a discharge of a viscid, curdy, yellowish matter, resembling pus and mixed with tears, issues from the *puncta lachrymalia*, on compressing the space situated between the internal canthus of the eye and the nose.

If the term *fistula lachrymalis*, when applied to the disease of which I am about to treat, were a mere verbal inaccuracy, and had no influence on the diagnosis and treatment of the complaint, it would be a matter of little importance; but, since it involves a real error, and one which may easily mislead the young surgeon, as to the nature and mode of treating this, as well as other diseases of the *viæ lachrymales*, I think it necessary that some distinction should be made between these two morbid affections. Whenever, therefore, on pressing the lachrymal sac, though in other respects in a sound state, a viscid, curdy, yellow fluid, re-

sembling pus, flows from the *puncta lachrymalia*, I give to that morbid state of the lachrymal passages the appellation of the *puriform discharge of the palpebræ;* and I would restrict the term *fistula lachrymalis* to that form of disease, in which the lachrymal sac, besides being greatly distended, is ulcerated, and in a fungous state on its internal surface, and has burst externally, or is accompanied with a caries of the *os unguis.*

The curdy, viscid humour mixed with the tears, which in the first instance flows back again through the *puncta lachrymalia*, is not formed by the sac, as is commonly believed; but is for the most part transmitted to it from the eye-lids by the *puncta lachrymalia*, from which it regurgigates, upon the eye whenever the sac, which is gradually filled with it, is pressed upon. This puriform humour is principally furnished by the internal membrane of the palpebræ, and comes more particularly from the lower eye-lid along the tarsus, and from the glands of Meibomius: the sebaceous matter peculiar to these glands, being not only secreted in larger quantity, but also acquiring an acrid and irritating quality, according to the general state of the habit with which they participate.

This morbid state of the sebaceous glands is very frequently derived from a catarrhal flux, from a scrofulous taint, from the small-pox, and from herpetic eruptions, especially of the face, improperly repelled, from acrid matters coming in contact with the eye-lids, or communicated by contagion, as in the purulent ophthalmia of infants, or in that which is regarded as contagious in adults, arising from

the application of specific or venereal virus. In addition to the sebaceous matter which is copiously secreted by these glands, a greater quantity than usual of thin mucus is poured out from the internal membrane of the palpebræ, which greatly contributes to increase the quantity of viscid curdy humour, which, in these cases, is diffused over the eye and eye-lids*.

That the puriform humour which issues from the lachrymal sac on the application of pressure originates from these sources, is rendered evident by everting the affected eye-lids, particularly the inferior one, and comparing them with those of the sound side. For the internal membrane of the former is invariably found redder than natural, and presents a villous appearance, especially along the tarsus; the edge of the eye-lid is tumefied and discoloured with innumerable small varicose vessels; the glands of Meibomius are more turgid and projecting than in a natural state, and not unfrequently, when examined with a powerful glass, appear to be slightly ulcerated.

The villous structure, then, which the surface of the internal membrane of the palpebræ assumes in these cases, becomes an organ, secreting a larger quantity of fluid than usual, resembling viscid lymph, which, as before stated, being mixed with the sebaceous matter, copiously effused from the glands of Meibomius, constitutes the whole of that viscid fluid with which the eye-lids are imbued, and which is continually carried by the *puncta la-*

* Rudolphus Vehrens has called this disease *Epiphora Sebacea.* See Haller's Addenda to Boerhaave's *Methodus Studii Medici.*

chrymalia into the sac, so as to fill, and also frequently distend it, until it forms a tumor.

If indeed the lachrymal sac is emptied of this matter, by means of compression, and the eye and internal surface of the palpebræ are carefully washed, so that none of the glutinous humour pressed from the sac may remain upon them, and the eye-lids are everted half an hour afterwards, the internal surface, especially of the lower one, will be found covered with a fresh effusion of mucus mixed with sebaceous matter, which has evidently not flowed back from the lachrymal sac upon the eye, but has been generated between the eye and the palpebræ, and there poured out by the villous surface of their internal membrane, and the glands of Meibomius. That the internal membrane assuming a reddish, villous and fungous appearance, may change its natural exhalant action, and become an organ, secreting an immoderate quantity of mucus, we have an instance in that species of *puriform discharge of the palpebræ*, produced by the incautious application of the matter of gonorrhœa to the edges of the eye-lids. For in this case the eye and palpebræ are first of all inflamed, the internal membrane of the latter then becomes tumefied, putting on a reddish villous appearance, and a prodigious quantity of viscid, yellowish humour is afterwards poured out, similar to that which is discharged from the urethra, in a venereal gonorrhœa. In the common *puriform discharge of the palpebræ*, however, which is not gonorrhœal, the secretion of mucus from the internal membrane of the eye-lids, and the glands of Meibomius, is not so considerable as in that arising from the application of

venereal matter; nor is it always preceded like that by most acute inflammation of the eye-lids and conjunctiva. In general it takes place slowly, in consequence of chronic ophthalmia, and in proportion as the puriform fluid is secreted, the weeping of the eye becomes more troublesome from its partly lodging upon the eye and palpebræ, and the rest descending through the *puncta lachrymalia* into the sac, where it collects and prevents the free descent of the tears into the nose, and from whence, by pressure, it is made to regurgitate upon the eye.

As a further proof that the lachrymal sac has no other share in this disease than that of receiving and retaining, together with the tears, the puriform humour which is transmitted to it from the affected palpebræ, it is sufficient to observe, that if the morbid secretion of the eye-lids is retarded or suppressed, either accidentally or by means of repercussive and astringent applications, little or none of this viscid, curdy humour is collected in it, or can be forced from the *puncta lachrymalia* by the application of pressure. For, if in the highest degree of this disease the eye-lids are accidentally attacked with acute inflammation, or with erysipelas, when that appears on the face, the effect of which, as of all acute inflammations, is to suppress every kind of secretion in the parts affected with it, the accumulation of puriform matter in the sac ceases altogether, which returns as soon as the inflammation of the palpebræ has abated, and the copious morbid secretion of their internal membrane, and of the glands of Meibo-

mius, is reproduced. I have frequently ascertained that the same effect is produced when an inflammation of those parts is artificially excited, by the introduction of any strongly irritating substance between the palpebræ and the ball of the eye: as I have also constantly observed that the puriform discharge may be radically cured at its commencement, and before it has induced any flaccidity of the sac, by timely correcting the morbid secretion of the internal membrane of the palpebræ, and of the sebaceous glands situated along the tarsus, and by keeping the lachrymal passages cleansed by injections of simple water through the *puncta lachrymalia* into the nose.

If, however, notwithstanding what has been advanced, some may yet persist in believing that the puriform humour in this disease is formed rather by the internal membrane of the sac than the palpebræ, it may not be improper for them to consider, that the internal membrane of the former is precisely the same as that which lines the frontal and ethmoidal sinuses, being of a very delicate texture, entirely destitute of sebaceous glands, and fitted to secrete a thin mucus, but not a tenacious, unctuous matter, such as that which in this disease forms so considerable a part of the fluid which issues from the lachrymal sac. It is not, indeed, improbable that a small part of the thin mucus which lubricates the internal membrane of the sac may be mixed with the puriform humour transmitted to it by the *puncta lachrymalia*; but we are not warranted to assert from thence that the principal part of the puriform humour,

which flows back upon the eye by pressure, is formed in the sac. If the sac happen to be inflamed internally, suppurate and burst, a turbid matter undoubtedly issues from it with the tears; but this matter is true pus, proceeding from the membranes of the sac in a state of inflammation and ulceration, and altogether different from the curdy unctuous fluid which takes place in the disease I am now treating of*.

* To this theory on the origin, progress and formation of the *fistula lachrymalis*, Hamely and Flajani have made the following objections. First, that they have observed the *fistula lachrymalis* without the least morbid alteration of the eye-lids and Meibomian glands; in the second place, that every puriform discharge of the eye-lids is not succeeded by the *fistula lachrymalis;* and lastly, that the *fistula lachrymalis* is cured by means of the operation alone, without regarding when it exists, the morbid state of the eye-lids or sebaceous glands. In asserting, as I have, that the origin of the *fistula lachrymalis* in general manifests itself on the eye-lids before the lachrymal passages are affected, I do not pretend thereby to exclude altogether the possibility of a case in which the membranes composing the nasal duct and lachrymal sac may be loaded, thickened, obstructed and ulcerated independently of the disease of the eye-lids. In the healing art there is no rule so general as not to admit of some exception. I have only endeavoured to shew that the *primordia* of this disease make their appearance on the eye-lids, and that the disorder is gradually propagated to the *viæ lachrymales.*

In the course of more than thirty years' practice, not a single case of *fistula lachrymalis* has yet presented itself to me, which has not been preceded for some months, and sometimes for years, by repeated attacks of slight or severe ophthalmia, chronic tumefaction of the edges of the eye-lids, especially the lower, and by a more or less intense redness and villous state of that portion of the internal membrane of the eye-lids, which invests their edges, a condition which is never inseparable more or less from weeping of the eye, and afterwards an increased secretion of gum. The first disordered state is observed, indeed, to continue for some time, i. e. the change in the reciprocal action between the

If the real origin therefore of this disease be not in the lachrymal sac, but in the internal membrane

organs secreting the tears, and the passages by which they are poured into the nose; to the simple weeping of the eye is then added a tenacious puriform mucous matter, evidently proceeding from the vitiated secretion of the MEIBOMIAN glands, and internal membrane of the eye-lids, which is turgid and preternaturally red. The patient now begins to find the eye-lids on the affected side gummed up in the morning. The viscid humour, which is of an unctuous and sebaceous nature, not miscible in water, and different from mucus, certainly does not regurgitate from the lachrymal sac upon the eye; as, in this first state of the disease, the sac when pressed on is neither painful nor turgid, nor is any thing discharged from it upon the eye except tears, the greater part of which, together with the yet dilute and fluid gum, find a ready descent into the nose. When, however, the tears and secreted fluid are of an acrid quality, which not unfrequently happens, the fistula is preceded by an unusual redness of the *caruncle*, with excoriation of the internal commissure of the eye-lids, and of the projecting points of the *puncta lachrymalia;* the sac, notwithstanding this, frequently still remains for some time in a sound state. Lastly, the secretion of puriform gum now become more dense and tenacious than before, increases, and the lachrymal sac by little and little tumefies, and the patient complains of an unusual sense of uneasiness in the internal angle of the eye, which obliges him at intervals to apply his finger to it and press upon it; under which compression, for the first time, a yellowish sebaceous matter mixed with tears, similar to that of the dense gum which before imbued the eye, flows back upon it. All this takes place without any indications of the sac having yet suffered inflammation, suppuration, or ulceration, to which causes the source of this puriform matter can be referred. To suppose the appearance of the matter to arise from the increased secretion of the internal membrane of the sac, occasioned by irritation made on it from the acrimony of the tears and gum descending in contact with it, would be only to admit, that the remote cause of the disease proceeds from the morbid secretion, putting out of the question the internal membrane of the sac being incapable of secreting an unctuous sebaceous substance. In this state of things, it is observable, that if a timely use be

of the palpebræ, and sebaceous glands of Meibomius, it is very evident how great an error

made of the ophthalmic ointment of Janin, the puriform secretion is found in the course of two or three weeks to be diminished or suppressed, the tumid edges of the eye-lid reduced, and the vascular villous state of the internal membrane faded, and lastly, that the matter which flows back on the pressure of the sac is only a turbid, mucous lymph, a clear indication that the accumulation of dense unctuous fluid in the sac, of a purulent appearance, but different from the true pus which regurgitates in consequence of suppuration and ulceration of its internal membrane, was, from the commencement of the disease, derived from the morbid secretion of the eye-lids. And when the disordered state of these parts proceeds only from atony of this receptacle, or from compression made on the orifice of the nasal duct, from the presence of polypus in the corresponding nostril, the humour which flows back on the eye consists only of pure tears.

We cannot, indeed, deny the possibility that the *lues venerea*, and scrofulous, variolous or herpetic affections may partially attack the membrane of the nose, and from thence extend to the nasal canal and lachrymal sac, without previously contaminating the eye-lids; but if experience is consulted, it is found that in general they proceed in a different manner and that the disorder before occasioning the *fistula lachrymalis*, makes its appearance on the internal membrane of the eye-lids with repeated ophthalmia, thickening of the edges of the eye-lids, increased secretion of tears, and gum; to which inconveniences succeed the reflux of puriform matter from the sac, and afterwards the *fistula lachrymalis*.

That every puriform discharge from the eye-lids is not followed by *fistula lachrymalis* is unquestionable; and this most probably happens, either because the *lippitudo* has not been entirely neglected, or the secretion less dense and viscid than usual, descends freely with the tears into the nose through the canals, which are large and pervious; it being indubitable, that the puriform matter is only arrested in its passage in consequence of its excessive density and tenacity, or from atony of the lachrymal sac, from thickening of its coats, and of those of the nasal canal, or

is committed by those who confound this disease with the *fistula lachrymalis;* and consequently,

sometimes also from the preternatural narrowness of the osseous tube within which it descends; an occurrence which is not so unfreqnent as the greater part of surgeons may probably suppose. If, however, the *puriform discharge of the palpebræ* be vehemently *acute,* as in the case arising from the gonnorhœal virus conveyed from the urethra to the eye-lids, from the contagious ophthalmia, or that of new-born infants, the state of inflammation and tumefaction of the eye-lids in such cases is so enormous that the *puncta lachrymalia,* closed and deviating from their natural position and direction, are no longer capable of admitting either the acrid puriform matter, or even the tears, which therefore incessantly fall upon the cheek, together with the copious gummy secretion; and consequently cannot during the violence of the disease excite irritation or ulceration of the internal membrane of the sac. Generally speaking, it would not be an error to assert, that the *lippitudo* may exist without a *fistula lachrymalis,* but seldom or ever a *fistula lachrymalis* without previous *lippitudo.* To be satisfied of the truth of this, it is necessary to pay particular attention to the phænomena which precede this disease a long time before its appearance; for as soon as the lachrymal sac begins to be distended by the acrid, dense tenacious gum, the disease of the *viæ lachrymales* and that of the palpebræ are confounded together. And in the advanced stage of the *fistula lachrymalis,* even after the disordered secretion of the eye-lids is cured, the morbid state of the lachrymal passages always continues, which renders an operation indispensable.

In short, although some examples of *fistula lachrymalis* may be adduced which have been cured by means of an operation, without attention being paid to the diseased secretion of the eye-lids and Meibomian glands, this is not in my opinion an argument sufficiently convincing to prove the contrary of what has been asserted with regard to the remote and most frequent origin of the disease, and the proper method of treating it; for we sometimes find that particular vices of the constitution, under the use of appropriate internal remedies and of a well regulated diet, disappear or are transferred to other parts without the application

how improperly it is proposed in the treatment of the *puriform discharge of the palpebræ* to heal an ulcer of the internal membrane of the sac, which does not exist, or to open a passage for the tears into the nose by the dilatation of the nasal canal, which is supposed to be entirely, or in a great measure, obstructed; but in reality is not so. For in these cases, strictly speaking, the nasal canal cannot, in general, at least, be said to be obstructed, unless either relatively with respect to the density and tenacity of the puriform matter, which attempts to pass from the palpebræ into the cavity of the nostril, or in consequence of the irritation which this acrid matter generally produces in the *viæ lachrymales*, occasioning a slow inflammation with thickening and tumefaction of the membrane, lining the nasal duct and corresponding nostril: and so far it may be said to be more confined than in a sound state; but it is not, as is generally taught, closed.

And in order to proceed with this subject in as

of topical remedies. Flajani, in order to cure the *fistula lachrymalis* in its first stage, injected through the *puncta lachrymalia* into the sac a certain balsamic liquor, which was probably detersive and astringent, without any view of correcting by this means also the morbid secretion of the palpebræ; but it is probable that this liquid, by passing between the eye and palpebræ, contributed to the suppression of the immoderate palpebral secretion, the primary origin of the disease in the lachrymal passages. And it remains to be known whether in those cases in which the morbid state of the internal membrane of the palpebræ and Meibomian glands was neglected, there was not a return of the *lippitudo* some time after the operation, or perhaps even a relapse of the *fistula lachrymalis.*

clear a manner as possible, which, unfortunately, appears only to have been rendered more obscure by what has been written upon it, I have thought it proper to divide the *puriform discharge of the palpebræ* into four stages. The first is that in which the puriform matter, secreted by the internal membrane of the palpebræ and the glands of Meibomius, meets with some obstruction in the sac, but is not absolutely prevented from descending through the nasal canal and discharging itself into the nose; being sufficient to produce a weeping of the eye, but not to distend and elevate the sac so as to form a tumor, which, on being pressed upon, yields only a turbid discharge of tears. The second stage of the disease is that in which the matter flowing from the eye-lids not being entirely discharged, or without great difficulty into the nose, from its excessive quantity and density, as well as from the tumefaction of the membrane which lines the nasal canal internally, constantly imbues the eye, increases the weeping, and, by gradually accumulating in the sac, distends and raises it in the form of a small tumor, from which, by compression, the sebaceous curdy yellow matter, mixed with tears, flows back copiously on the eye. The third stage is that in which the viscid matter, in consequence of its abundance, density, and acrimony, and perhaps still more from the excessive distension made by it on the sac, causes an inflammation, erosion, and suppuration of that cavity, and of the integuments covering it; and consequently occasions an ulcer of the *viæ lachrymales*, extensive internally,

but narrow externally, from which is discharged a mixture of tears, puriform matter, and true pus. This third stage of the *puriform discharge of the palpebræ*, is that to which the term *fistula lachrymalis* properly belongs, especially if the ulceration has been for a long time neglected, or improperly treated. Lastly, the fourth stage of this disease, is in a great measure the same as the *fistula lachrymalis*, but accompanied with a caries of the *os unguis*, and sometimes a spongy state of the *ethmoides.*

From the consideration of this progressive series of stages of the *puriform discharge of the palpebræ*, the difference between this disease and the *fistula lachrymalis* must be very obvious, and consequently what is the true and principal origin of the latter. And since, from what has been stated, the primary and principal cause of the *fistula lachrymalis* does not exist either in the sac or the nasal canal, as it has been hitherto believed, but in the palpebræ, or more properly speaking, the morbid secretion of their internal membrane and the Meibomian glands situated along the tarsus, it must necessarily follow that every method of treating that disorder, which is merely directed to heal the ulceration of the sac, or to overcome the obstruction of the nasal canal, can never effect a permanent cure of it, unless such practice be conjoined with other measures calculated to correct effectually the morbid secretion of the palpebræ, and consequently remove the principal source from which it is derived.

With respect then to the first stage of the *puri-*

form discharge of the palpebræ, or when the weeping is incipient and the affection of the eye-lids recent, in which the viscid humour transmitted from the palpebræ through the *puncta lachrymalia* into the sac, though it is somewhat detained in the latter, does not however distend it, nor raise it into a tumor, the cure may be effected without having recourse to the division of the sac, or any other painful operation. The treatment consists in restraining the immoderate secretion of the glands of Meibomius, and internal membrane of the palpebræ, and in assiduously cleansing the *viæ lachrymales* through their whole extent, from the *puncta* into the nose, in order to prevent any of the acrid, sebaceous matter from lodging in them, and also to render the descent of it together with the tears free and open into the nose; an advantage which is always obtained by means of injections through the *puncta lachrymalia*, provided they are employed in time, or at the onset of the disease, on the first appearance of the weeping, and before there is any distension and tumefaction of the lachrymal sac.

The best local remedy for the purpose of suppressing the morbid secretion of the eye-lids, is the ophthalmic ointment of Janin *, employed at first with a larger quantity of lard than is directed

* Take of hog's lard half an ounce, prepared tutty and armenian bole, of each two drams, white precipitate (calx hydrarg. alb.) a dram. The hog's lard, having been washed three times in rose-water, should be intimately mixed in a glass mortar, with the other ingredients previously reduced to a fine powder.—*Memoires sur l'Oeil.* This preparation is imperfect and of little utility, unless the powders be reduced to an impalpable state.

in the formula, or lowered by the addition of fresh butter, until the patient is gradually accustomed to the very acute stimulating effect which this application in its full strength produces on the eye and eye-lids. A portion of this ointment, equal to the size of a barley-corn, should be introduced upon the point of a blunt probe morning and evening, between the palpebræ and ball of the eye, near the external angle, and the edges of the eye-lid smeared with it; the patient should then be directed to close the eye, and rub the palpebræ gently, so that the ointment may be equally distributed upon the whole of their internal surface; a compress and bandage should be applied over it, and the patient desired to keep his eye-lids closed in this manner during two hours. At the expiration of this time, the eye should be washed with cold water, and a few drops of a collyrium, consisting of four ounces of plantain water, five grains of vitriolated zinc, and half an ounce of the mucilage of quince-seed, instilled into the eye three or four times in the course of the day.

Besides the affection of the glands of Meibomius, and the villous appearance of the internal membrane of the palpebræ, the disease is sometimes accompanied with superficial excoriations on the edges of the eye-lids. To these the ointment before-mentioned may be employed, or if they should resist the use of this application, the *unguentum nitratis hydrargyri* of the Edinburgh Pharmacopœia. This remedy should be used by previously warming a small portion of it till it li-

quefies, and then with the point of the finger, or fine hair pencil, smearing it upon the edges of the eye-lids at the time when the patient goes to bed. But if this remedy should not produce the desired effect, recourse must be had to the *argentum nitratum*, as employed by S. Yves, which should be drawn gently along the edges of the palpebræ, washing the eye immediately afterwards with new milk. In cases likewise of the *puriform discharge of the palpebræ* accompanied with a varicose state of the vessels of the conjunctiva, it will be advantageous to conjoin with the use of the ophthalmic ointment, that of the *tinctura thebaica* with the cautions laid down in the chapter on ophthalmia; or when the palpebral discharge has ceased, the cure may be completed by it.

In order to render the lachrymal passages permeable, and to preserve them free from the puriform humour which descends from the eye and lodges in them, the surgeon, previously to the use of the ophthalmic ointment, should inject some warm simple, or plantain water, rendered more active by the addition of a little spirit of wine, through the *puncta lachrymalia*, morning and evening, by means of Anel's small syringe; and this injection should be repeated at each time, until it is evident that the fluid thrown into the *puncta lachrymalia* has passed freely into the nostril and fauces.

This means, the utility of which is incalculable in the treatment of the disease in its origin or first stage, was known to all the surgeons of the last

age, but is now employed by very few, or rather has nearly fallen into disuse. The reason assigned, is its inefficacy in the treatment of the *fistula lachrymalis*, strictly so called; but which ought to be imputed to the improper application of it. In the second, and more particularly in the succeeding stages of the *puriform discharge of the palpebræ* in which the secretion is copious and tenacious, the lachrymal sac also in a dilated and atonic state, and the nasal canal loaded with dense matter, it is certainly highly improbable that the small stream of water forced through one of the *puncta lachrymalia* should be sufficient to overcome all these obstacles. But this is not the case in the first stage of the disease, when the puriform matter is yet dilute, the lachrymal sac in no degree dilated, nor the descent of the tears and puriform humor into the nose impeded. Under these circumstances, or on the first appearance of the disease, I can affirm, that by persisting in the practice of injecting warm water through the *puncta lachrymalia*, it will invariably be found that either immediately, or in the course of a few days, the water will pass freely into the nose. And if this is not effected in the other stages of the disease, it is not to be attributed to the imperfection of the means, but to the want of seizing the proper opportunity when it might be employed to advantage.

The phenomena which present themselves during the treatment of the first stage of the *puriform discharge of the palpebræ*, are the following: The secretion of puriform matter is at first

more copious than before, provided the irritation produced by the ointment does not exceed certain limits, and occasion an inflammation of the palpebræ*. The edges of the eyelids, especially of the inferior, which before were tumefied and rigid, now become gradually thin, soft, and flexible; the glands of Meibomius insensibly diminish, and the internal surface of the palpebræ, which had previously a florid, villous, or fungous appearance towards the margin of the eyelid, gradually recovers its natural smoothness, and becomes pale. And as these favourable changes succeed each other, the puriform discharge diminishes in quantity, and becomes thinner and more fluid, and no longer imbues the palpebræ and cilia. If the sac be compressed at different intervals, a discharge of turbid tears only takes place from the *puncta lachrymalia*, and, finally, the natural secretion of the palpebræ being entirely restored, no more of the puriform matter flows back from them, a few pure and limpid tears only being discharged, and lastly, the action of the nasal canal being re-established, the slight weeping also ceases altogether.

These advantages are obtained for the most part in six weeks, if there be no obstinate internal causes depending on the patient's general constitution, which resist the use of appropriate remedies, and towards the end of the local treat-

* In order that this remedy may produce its proper effect, however, it is necessary that it should induce a certain degree of irritation exciting a little warmth and redness in the palpebræ and *conjunctiva*, during the time it remains upon the eye.

ment, occasion a determinationto the eyelids, as too often happens in those who are affected with scrofula, especially on the approach of spring or autumn, and in those who have suffered much from a variolous, catarrhal, or herpetic metastasis. In these complicated cases depending on intractable diseases of the habit, for which there are no specific remedies, the treatment is of much longer duration than in the others; a cure, however, may be ultimately obtained, by a steady perseverance in the use of the topical applications already mentioned, and the injection of warm water through the *puncta lachrymalia* until it pass into the nostril, and also, by derivation by means of a seton in the neck, and the internal use of remedies, if not capable of radically curing, at least, of checking the morbid predisposition; of these distinct mention will be made in the chapter on Ophthalmia.

Conformably with these views of the first stage of the *puriform discharge of the palpebræ* and the method of treating it, we are enabled to form a correct judgment of the case related by Fabricius Hildanus, in his Cent. IV. Obs. XX. of a lady about thirty years of age, who had been afflicted with a *fistula lachrymalis* for two years, which he cured in four months, merely by making a seton in the neck, and by the frequent use of an appropriate collyrium. This supposed case of *fistula lachrymalis*, appears to have been only a *puriform discharge of the palpebræ*, which, although of two years' standing, had fortunately not proceeded beyond the first stage of the disease; and in conse-

quence of the determination made to the neck and the action of the collyrium, which was probably astringent, assiduously dropped into the eye, the morbid secretion of the eyelids was suppressed, and consequently, ceased to taint the eye, or obstruct the course of the tears. A great number of these examples may be met with both among ancient and modern writers on the diseases of the eyes, although improperly enumerated among those of *fistula lachrymalis* *.

I have great reason to believe, that if, on the first appearance of the morbid affection of the eyelids, and consequently of the weeping, and before the secretion has become copious, viscid, and tenacious, these local and general remedies were had recourse to, especially the injection of warm water through the *puncta lachrymalia*, until it descend freely into the nose, the instances of *fistula lachrymalis* would be very rare. But as the disease in this its first stage does not excite any particular pain, or produce tumefaction in the part situated between the internal angle of the eye and the nose, and only occasions a slight weeping of the eye in the day-time, and at the night, some degree of cohesion of the eyelids; and as this discharge of tears in the day-time becomes even more tolerable if the patient have the precaution to press occasionally upon the internal canthus of the eyelids, and frequently wash the

* I have very frequently seen, says Pott, cases of incipient *fistula lachrymalis* cured merely by means of a good diet, and the application of the vitriolic collyrium.

Observ. on the Fist. Lachrym.

eye; it very often happens, that not only the lower classes of people, but also the more opulent, neglect this form of the disease for a considerable length of time, and have not recourse to surgical assistance, until the disease has arrived at the second stage, or when it is accompanied with distension and manifest tumefaction of the lachrymal sac, excessive weeping of the eye, copious secretion of the eyelids, and complete infarction of the nasal canal; in which state of things, besides the remedies above-mentioned for suppressing the morbid palpebral secretion, other more effectual measures are requisite, in order to free the canal from the dense humor lodging in it, and facilitate the descent of the tears from the lachrymal sac into the nose.

For, in the second stage, when the viscid, copious, puriform matter, retarded in the sac, has gradually, and, in the course of years, distended, and elevated it externally in the form of a small tumor, although the primary indication which the surgeon ought to fulfil, be, in every period of the disease, to correct the morbid secretion of the palpebræ; yet the fulfilment of this, as well as the no less important indication, that of rendering the nasal canal permeable by injections through the *puncta lachrymalia*, are not sufficient, under these circumstances, to cure the disease; other more effectual means than those now proposed, being necessary for this purpose. And these measures ought to be employed with the more solicitude, as the distension which has now commenced in the sac disposes the membranes of

this receptacle and the integuments covering it, to inflammation and ulceration; and because, although the morbid secretion of the palpebræ be perfectly corrected, whenever from the obstruction occasioned by the lodgment of the dense humor in the canal, the lachrymal sac is kept constantly distended, the retention of the tears in it, the further dilatation of it which is sometimes enormous, and the perpetual weeping of the eye, are inevitable consequences.

It is evident, that to avoid this discharge of tears, it is not only necessary that the nasal canal should be sufficiently open into the cavity of the nostril, but also that there should be a certain proportion between the calibre of this canal and the capacity of the lachrymal sac; otherwise, if the latter exceed its natural dimensions, the tears poured into it from the *puncta lachrymalia*, as all fluids propelled through narrow tubes into large ones lose much of the motion originally communicated to them, are retarded, and accumulate greatly in the sac, and consequently flow back in the same degree upon the eye, even without compression made on it.

To fulfil this important indication, the necessity of which has been felt by all surgical writers, that is, to prevent the accumulation of the puriform matter and tears in the sac, and consequently the ulterior distension of it, which, as I have said, is sometimes enormous; it has been proposed to make use of astringent lotions, consisting of a strong solution of alum in the infusion of oak-bark; others have suggested a firm and long-continued

pressure upon the sac, by means of a small instrument resembling a tourniquet. Both these methods are, however, altogether inadequate to the purpose, for several reasons, more particularly because they do not contribute to remove the source of the disease, and the obstacle arising from the tenacious concrete humor in the nasal canal. The only really efficacious means of cure in addition to those before mentioned, is that of making an incision or puncture into the dilated sac, and introducing a probe through it into the nasal canal and corresponding nostril, by means of which, the passage being made pervious to the matter and tears, the cause of distension in the sac is removed, and its membranes are allowed to recover their natural capacity and tone*.

For the cure then of the second stage of the *puriform discharge of the palpebræ*, the patient being seated, and his head properly held by an assistant, the surgeon should direct him to close his eyelids, and gently pressing upon those of the

* A case of this second form of the disease has occurred at the Public Dispensary, in which the lachrymal sac was immoderately distended, and the integuments covering it discoloured and tender to the touch, yet by merely employing the *unguentum hydrarg. nitrut. mitius*, which was introduced between the eyelids twice a-day, and directing the patient to empty the sac as often as there was any accumulation of matter in it, by pressing upon it with the finger, the symptoms gradually disappeared, and the disease in the course of some weeks was removed; a slight discharge of tears, however, occasionally took place whenever the eye was exposed to cold air. This instance would seem to prove that, however judicious the operation here proposed by Professor Scarpa is in the generality of cases, it may not be always necessary.—TRANS.

affected side with the index and middle finger of one hand, with the other he should carry the point of a straight double-edged bistoury immediately below that small whitish spot of the integuments, which is naturally seen in all individuals on the internal commissure of the palpebræ, covering the tendon or ligament* of the orbicular muscle; and pressing the point of it freely forwards, should penetrate the cavity of the lachrymal sac. The puncture in general will be a line and a half or two lines in length, from above downwards, according to the obliquity of the fold which the lower eyelid makes, and which nearly corresponds to that of the osseous *sulcus* in which the lachrymal sac is situated†. If the surgeon is ambidextrous, he should puncture the lachrymal sac of the left side with his right hand, and *vice versa* that of the right side with his left, taking care that the point of the bistoury fall perpendicularly upon the sac itself, and never pass obliquely between the integuments and sac, or between the margin of the orbit and the globe of the eye.

In performing this operation the young surgeon should, in no instance, depart from the rule here laid down, of puncturing or dividing the sac, accordingly as it may be requisite, by plunging the point of the bistoury immediately below the whitish spot of the integuments, which is seen between the internal angle of the eye and the nose. For in great dilatations of the sac, accompanied with ulceration, which are always attended with tumefaction of

* Plate I. c. † Plate I. c. b.

the neighbouring parts, the uncertainty of penetrating with precision into that cavity, and of extending the incision accurately in the course of it, is so great, that even the best anatomists may, by not paying attention to this circumstance, easily get out of the direction, or open it but imperfectly, and in the least commodious manner. Under this small whitish spot of the integuments, the sac never deviates from its natural position, however distended, flaccid, and altered by disease, since it is firmly confined in its situation at this part, as I have stated, by the ligament or tendon of the orbicularis muscle. When the point of the bistoury, then, has fairly penetrated the cavity of the sac near to its summit, the rest of the incision in it through its whole extent, in cases in which, as will be hereafter seen, it may be judged necessary, is executed with equal ease by following the concavity of the inferior arch of the orbit where the natural fold of the eyelid has been effaced by the excessive tumefaction and displacement of the lachrymal sac.

In the second stage, therefore, of the disease, a simple puncture being made of a line and a half, or of two at most, in the part just described, a common probe is to be introduced into the sac, with its point directed downwards and a little backwards, at the part where the nasal canal commences; and having penetrated it, it is to be made to descend through the canal gently into the nose. If there is reason to believe that the duct is too much contracted from slow inflammation, and consequent

thickening of its coats, the probe is to be withdrawn and another rather thicker introduced, and after the removal of the latter, a silver pin* or style is to be placed in it, terminating in a head resembling a small nail, by which it rests on the external part of the sac, and the operation is thus completed.

The after-treatment consists in correcting the morbid secretion of the eyelids by external as well as by internal remedies suited to the nature of the general morbid predisposition; in removing the style every day, or second day, for the purpose of cleaning it, and injecting water through the aperture of the sac into the nasal canal until it pass freely into the nose. By this simple mode of treatment, the second stage of the *puriform discharge of the palpebræ* may be perfectly cured. For by a constant and steady perseverance in this plan, the matter secreted by the eyelids becomes dilute and fluid, and, by its being dissolved and mixing with the tears, is readily discharged into the nose along the style, which acts as a conductor; by this means, finally, the morbid secretion being entirely suppressed, and a free communication re-established between the ducts and the cavity of the nose, the weeping ceases entirely, and the eye is as dry as in a state of health.

It was but a short time after the publication of this work that I was aware of a phenomenon which before had escaped my attention, that, in cases, in which for the sake of precaution I had recom-

* Plate III. Fig. 14.

mended the thick leaden tent (Plate III. Fig. 10.) to be worn for a length of time; notwithstanding the presence of this solid body in the nasal canal, little or no inconvenience was suffered from the weeping; a circumstance which I could not account for, the leaden tent being of such a size as not only to occupy the calibre of the duct entirely, but even to distend it beyond its natural size. This invariable fact, however, convinced me at length that the tears passed between the tent and the parietes of the duct. Mr. Ware's observations * upon this subject came afterwards very opportunely to my knowledge, which left me no longer in doubt respecting the true explanation of this phenomenon, and its proper application to the treatment of this stage of the disorder; and which, for simplicity and facility of execution, as well as on account of its being attended with little or no inconvenience to the patient, merits, in my opinion, a preference to every other mode of operating yet employed for the cure of what is commonly called the *fistula lachrymalis*.

As the success of the treatment of this disease depends, in a great degree, on the style for conducting the tears being properly placed, the utmost care should be taken that this part of the operation is executed with the most scrupulous precision. And in this the surgeon will always succeed, if he be careful that the probe previously employed for dilating the canal does not perforate the *os unguis*, but passes along the duct through

* Chirurg. Observ. relative to the Eye. Vol. II.

its whole extent into the nostril; which may be known by observing that, after a slight resistance made to it at its entrance into the duct, it descends with ease along a smooth surface; and that, when it has entered the nose, its upper extremity is in contact with the superior margin of the orbit, and that the instrument is firmly fixed in that position; while, on the contrary, if the probe has perforated the *os unguis* (a thing more easy to happen than the young practitioner may imagine) the operator will perceive that the probe moves upon a rough surface, that its upper extremity is kept at a distance from the eyebrow, and inclined forwards; and lastly, that the instrument may be readily moved in all directions.

It is impossible to determine precisely the period at which the conducting style may be removed without danger of a relapse; this depending on the slow or speedy suppression of the *puriform discharge of the palpebræ*, and on the more rapid or gradual contraction of the lachrymal sac to its proper size *, and consequently the reciprocalness of action of all the parts constituting the

* At the time when I recommended my patients to wear for a length of time a thick heavy tent of lead (Plate III. Fig. 10.) instead of the fine style, as a conductor for the tears, I was of opinion that the contraction of the sac was owing to the pressure made upon it by the head of the tent: but experience has since convinced me, that the same advantages are obtained by the very finest style; and that, therefore, this effect is not so much to be referred to the pressure made upon it by the head of the pin, or tent, as to the natural elasticity and vitality of the membranes of the sac, after the distension made by the accumulation of the puriform matter and tears in it, has ceased.

lachrymal organ. It may be affirmed generally, that the longer the style is suffered to remain, the more perfect is the cure. I have rarely permitted its removal before the end of a year from the operation. Nor is it difficult to obtain the patient's compliance with this, as the presence of the instrument produces neither inconvenience nor deformity, particularly if the head, which is small, be painted of the colour of the surrounding skin. It is necessary to have the precaution, however, to clean the style twice a week, in order to prevent the collection of mucus upon it, and more particularly the formation of an earthy crust, as happened in the instance related Case VIII.

The third stage of the *puriform discharge of the palpebræ* applies to that state of the parts in which the weeping and gumming of the eye are aggravated by great distension and atony of the lachrymal sac, by fungous ulceration of its internal membrane, and by one or more fistulous apertures opening externally in consequence of repeated inflammation and suppuration of the sac *. This state of the disease, strictly called *fistula lachrymalis*, is, fortunately, rarely met with in practice; for however little regard may be paid to the disorder while in its incipient state, and little inconvenience is suffered from it, the patient,

* It sometimes happens that the sac suppurates and bursts externally, without having been previously much distended, and without there being any fungous ulceration of it internally. In this case, which, however, is very rare, the disease may be regarded as yet in its second stage, and consequently cured in the manner before laid down.

whatever may be his condition, seldom fails to apply for assistance as soon as he finds a disturbance to the sight from the accumulation of puriform matter and tears lodging upon the eye, and a swelling begins to form between the internal angle of the eye and nose; or, in other words, while the disease is in its second stage.

In the third stage of the disorder, the distension of the sac, and the swelling which it forms externally, is, as I have stated, very considerable; the skin which covers it is thin, and striped with red, having one or more apertures in it, from which purulent matter, mixed with tears and mucus, is discharged; and if a probe is introduced into them, obstructions are met with in all directions, which readily bleed from the gentlest use of it. In this condition of the parts, there can be no prospect of being able by the mere use of the style to effect the destruction of the fungus and healing of the internal membrane of the sac, as well as the contraction of the latter, now become atonic, to its natural size. For if even the source of the morbid secretion of the palpebræ were removed, the matter and viscid humor would still continue to collect in the cavity of the sac, which could not flow along the style into the nose. This state of the disorder is only to be remedied by making, instead of a simple puncture in the sac, a division of it through its whole length, and afterwards applying such local remedies to it as are found useful in the treatment of fungous ulcers in general. The sac being divided, then, in the third stage of the disease through its

whole extent, so as to expose its internal surface, the surgeon should introduce into the lowest part of it a moderate sized probe, which he should push gently through the nasal canal into the corresponding nostril. After having withdrawn the probe, he should introduce into the duct a bougie of a proper thickness, an inch and an half long in the case of an adult, pressing it forwards, until the extremity which has entered the nostril, is incurvated towards the fauces, and the other end being secured by a thread, has descended so deeply as to be concealed at the lowest part of the sac, and precisely at the entrance of the nasal duct; in short, that the bougie may preserve the dilatation of the nasal canal without occupying any part of the cavity of the lachrymal sac. A piece of elastic gum tent, of an equal length and thickness, answers extremely well and even better than the bougie, on account of its great smoothness and flexibility. A bougie, or elastic gum tent, an inch and an half long, for an adult, is preferable to one shorter, as in consequence of its being incurvated to a certain extent in the nostril towards the fauces, it remains constantly in its situation at the lowest part of the sac, and is entirely concealed in the nasal canal, while the other by its shortness is easily forced upwards and outwards through the incision by sneezing, and prevents the dressings from remaining at the bottom of the wound in the sac. Nor is it a matter of indifference during the treatment of the fungous and ulcerated state of the sac, whether the passage of the nasal duct be

preserved open or not, as we know the great tendency which there is in the ducts of the animal body, to contract and become obliterated, when even a small part of the fluid which they are accustomed to convey, ceases, but for a short time, to pass through them.

Having thus filled and kept open the nasal canal, the surgeon should examine the whole preternatural extent of the lachrymal sac, with a bent probe, especially that part of it which is situated above the tendon of the orbicular muscle*, and which has not been included in the incision. This will serve him as a guide for calculating the progress of the contraction of the sac, an object of great importance in effecting a complete cure of the third stage of this disease. Lastly, the whole cavity should be carefully filled with soft lint, which should be retained in its situation by means of a compress and bandage†.

On the third day after the operation, if the lips of the wound have begun to suppurate, the dressing should be renewed; and this should consist in washing the wound, and filling the bottom of the cavity of the enormously dilated and fungous sac, in the most exact manner with soft lint dipped in a liniment, consisting of the hydrargyrus nitratus ruber and mucilage of gum-arabic. This escharotic is very gentle in its action, and corresponds to what are called mild or *indolent*

* Plate I. a.

† For the description and method of applying this bandage, see Heister's Surgery, Part III. sect. i. p. 357.

caustics: it gives the patient little uneasiness, and produces daily a greater contraction of the sac, by gradually destroying the fungus substance into which the internal membrane of this receptacle has degenerated. At every application the dossil of lint is covered with a whitish slough or skin; and by persisting in this treatment, the fungus is destroyed, and the capacity of the sac gradually diminished. And if it should appear to resist this application, the cavity should be filled with the hydrarg. nitrat. ruber, either alone or mixed with a little alum, and if necessary, also repeatedly touched with the argentum nitratum. By means of these escharotics, the tumid, villous internal membrane of the immoderately dilated sac will be reduced to the state of a simple ulcer, the healing of which must be necessarily attended with a corresponding contraction of its cavity. The most scrupulous attention ought to be paid at each dressing, that the external edges of the sore are kept open, and only suffered to contract in proportion to the rest of the sac, either by the careful introduction of lint or sponge. While these means are employed, it will be proper to introduce between the eyelids, morning and evening, the ophthalmic ointment of Janin, and to direct the vitriolic collyrium to be instilled three or four times a day, in order to correct the morbid state of the eyelids; without which a complete cure of the disease cannot be obtained in any of its stages.

As soon as the sac is nearly reduced to its na-

tural capacity, which may be ascertained by examination with the bent point of a probe, the use of escharotics should be suspended, and lint dipped in a mixture of [illegible] calcis and mel rosæ substituted in the place of them. Afterwards, when the process of cicatrization has proceeded from the edges of the incision to the bottom of the sac, and the discharge of matter from it has ceased; in short, when the internal surface of the sac is healed, it will be proper to withdraw the bougie or elastic gum tent from the nasal canal, in which it had been placed from the beginning of the treatment, and substitute in its place the style for conducting the tears, which [illegible] should wear for a longer time than is usu[illegible] cure of the disease in its second stage, th[illegible]n the third period of the disorder having suffered a greater alteration in their structure and action than in the former.

The older surgeons made great use of escharotic applications for the cure of the *fistula lachrymalis*, but they erred in not confining themselves to those cases in which it was necessary to destroy the fungus state of the internal membrane of the sac, and promote its contraction; but applied them in every form of the disease, even when there was not the slightest mark of ulceration, as in the first and second stages of it. The elder Nannoni* has carried this inconsiderate practice still farther, by applying the caustic in every period of the disease so far as entirely

* Trattato Chirurg. sulla semplicità del med. Osserv. xxxi.

to destroy the sac, and *convert it into a perfectly solid and callous body*; which he did with the more confidence from a persuasion, which it is not easy to comprehend or admit, that "*when the lachrymal sac is converted into a solid body, the tears occasion little or no inconvenience*:" an opinion which stands in perfect opposition to anatomy, and the design of nature in the formation of those parts. But as this writer adduces instances of persons, in whom, after such improper treatment, there remained no weeping of the eye: we have a right to infer on anatomical principles, that in these successful cases the caustic had caused the [illegible]ce of the sac to exfoliate, but had [illegible]ed the cavity, nor destroyed its communication with the nasal canal; or that its destructive action had extended beyond the sac to the *os unguis* and pituitary membrane, through which on the detachment of the eschar, a new and ample passage was opened for the tears from the sac into the nose, in spite, it might be said, of the operator, who had used all his endeavours to leave his patient with a perpetual weeping of the eye.

The fourth stage of the *puriform discharge of the palpebræ*, called by surgeons *fistula lachrymalis cum carie*, is a disease less common than was formerly imagined, but which, however, is sometimes met with; and from my own observations on this subject, it appears to me that this highest degree of the *fistula lachrymalis* presents itself under two distinct forms. The first is that in which the sac, having been for a considerable time enormously dis-

tended, and filled with a mixture of matter, tears, and the puriform humor of the palpebræ; is entire externally, but internally is ulcerated, and opens into the corresponding nostril through the *os unguis*, which is carious and eroded; and in which the destruction of the parts is so great that the nasal canal is obliterated and destroyed, and may be considered as having no connection with the lachrymal sac. The other form of the disease is that in which the fungus and ulcerated sac opens externally, and the *os unguis* in its posterior part is denuded and carious, but not destroyed or perforated, and where the nasal canal is entirely closed and obliterated. The first form of this disease may be known, by observing that when the sac, which is very large, is even gently compressed, a very small portion only of the purulent humor contained in it issues through the *puncta lachrymalia* upon the eye, while the greater part of that fluid is discharged into the nose, and the capacious sac at the same time subsides and disappears, and the matter which flows from the nostril by pressure, has the fœtid odour peculiar to carious bone. The second form of the disease is rendered evident by the introduction of a probe into the sac, by which the *os unguis* is found denuded, and which on being pressed to the bottom of the sac, and turned in all directions, instead of entering the nasal canal, comes in contact only with fungus, indurated, and contracted parts.

The first form is not beyond the reach of art, and allows us to hope for a perfect cure, provided the disease affects only the *os unguis*, or a very small

part of the ethmoidal bone. For if the sac be laid completely open, without any regard to the restoration of the nasal canal, and its cavity cleared by means of the escharotic and astringent applications before-mentioned, the separation of the carious bone, and the contraction of the membranes of the sac, will, as experience has proved, necessarily succeed each other. During this treatment, the application of the ophthalmic ointment should not be omitted, conjoined with the internal use of such medicines as are adapted to correct the particular diathesis, by which the morbid secretion of the palpebræ has been produced and kept up. These advantages being obtained, and the internal surface of the sac healed, and nearly reduced to its natural size, the edges of the external opening in the sac should be permitted to approximate and adhere to the bone. The communication between the posterior part of the sac and the nostril, will be so large, from the deficiency of the *os unguis* and pituitary membrane which covers it internally, that the tears carried by the *puncta lachrymalia* and ducts into the part where the sac existed, will be immediately discharged into the nose.

The same method of treatment is attended with equal success in the second form of the *fistula lachrymalis*, accompanied with denudation of the *os unguis;* with this difference, that as the *os unguis* is only denuded, but not carious or perforated, and the pituitary membrane covering it on the side of the nostril is entire, and as there is no hope of being able to restore the action of the nasal

canal, in this case it becomes absolutely necessary to make a new and permanent passage for the tears from the sac into the nose, by perforating and destroying the denuded bone and the corresponding portion of the pituitary membrane. Experience has shewn, that the mere perforation of the *os unguis* and corresponding pituitary membrane, by means of the troiquart, without the destruction of a portion of the latter to some extent around the place of perforation and separation of the bone, does not answer the purpose; since this opening, in process of time, becomes too small for the discharge of the tears into the nose, and especially as it continues to contract so as to close entirely as soon as the tent is withdrawn, and it is left to itself. A very clear exemplification of this presents itself in the caries of the palate from a venereal cause, in which the carious portion of bone being separated, a communication sometimes remains between the nose and mouth, sufficient to admit the point of the finger; but if there has been little destruction of the substance of the membrane of the osseous palate; this aperture gradually contracts itself, and sometimes entirely, or in a great degree, closes up. And if this takes place under [illegible] circumstances, the closing of the pituitary [illegible]ne is much more to be expected after the [illegible]erforation of it by the trocar, in which [illegible]rane suffers no loss of substance. The [illegible]hich have been proposed for keeping [illegible]erforation of the pituitary membrane constantly open from the sac into the nose, are not to be confided in, since even those which are best

constructed for producing such an effect are very frequently, after a short time, forced upwards against the anterior part of the lachrymal sac, or they fall into the nostrils too soon, or in a very short time are filled with an earthy substance which renders them completely impervious and useless. The perforation of the *os unguis*, is the only certain and efficacious means hitherto discovered, which, in this combination of circumstances, can secure a free and permanent passage for the tears into the nose: to answer which purpose no mode of treatment appears better adapted than the application of the actual cautery, which, though certainly too freely employed by the older surgeons, has been too hastily rejected by the moderns*. The ancients cauterized the *os unguis* together with a portion of the pituitary membrane, in every stage of this disease, and most frequently without necessity; the moderns, on the contrary, neglect this very efficacious measure even in the worst state of the disorder, where it is manifestly requisite and necessary.

In order to apply the cautery to the *os unguis* and corresponding part of the pituitary membrane with the greatest safety and precision, the lachrymal sac should be divided through its whole extent, and its cavity filled with soft lin[illegible] should be retained in its place by me[illegible] compress and bandage. At the end of [illegible] the dressing should be removed, and [illegible] of the sac and denuded bone made [illegible]

* Of this opinion also is Richter. Obs. Med. Chirurg. ch. x.

dry. A canula* being introduced within the sac, and placed upon the *os unguis* in a direction a little oblique from above downwards; for if transversely, it would pass against the superior turbinated bone, and if perpendicularly, against the maxillary bone, the surgeon with one hand should hold the canula, and with the other pass the cautery† as far as the *os unguis*, upon which he should make a moderate degree of pressure, in order that the point of the cautery may not only pass beyond it, but also destroy the pituitary membrane which covers it internally.

And as it is a matter of the greatest importance for the complete success of the operation, that this part of the membrane should form an eschar, and be completely detached around the opening in the *os unguis*, if the surgeon therefore perceive that the point of the cautery cools too quickly, he should immediately apply a second, which he should have in readiness for that purpose. The cavity of the sac should be afterwards filled with lint spread with an emollient ointment, and the patient be directed to draw up his nostrils frequently in the course of the day the aqua malvæ in a tepid or cold state, as may be most agreeable to him. If, on the following days, the patient feel pain, and there be considerable tumefaction of the nose and palpebræ, they should be covered with a poultice of bread and milk, or of mallows. As soon as a separation has commenced between the sound and cauterized parts, the eschar of the pituitary

* Plate III. fig. 5.

† Plate III. fig. 6.

membrane will be discharged through the nose, together with the mucus, and the fragments of the *os unguis* will pass partly along with the matter by the external opening of the sac, and partly by the nostril. Into this new opening through the *os unguis* into the nose the surgeon should now introduce a bougie, or a piece of elastic gum tent tied with a waxed thread, to prevent its falling into the nostrils, the size of which should be increased in proportion as the new opening becomes larger by the loosening of other portions of the eschar of the pituitary membrane, or of other particles of bone. Besides the use of the ophthalmic ointment of Janin, in order to suppress the *puriform discharge of the palpebræ*, escharotic, detersive, and astringent applications should be employed at the same time, with a view to destroy the fungus and indurated parts of the internal membrane of the sac, and to obtain a contraction of its cavity nearly to its natural size. When the whole internal surface of the sac is nearly healed, if there be any appearance of fungus around the artificial opening from this part into the nose, it should be repressed by touching it frequently with the argentum nitratum; nor should this be omitted until the margin of this internal opening be as perfectly healed as the rest of the cavity of the sac. After which the lips of the external wound in the sac should be suffered to close around the style for conducting the tears, which the patient should wear for a length of time in order the better to obtain a permanent cure.

From what has been delivered in this chapter, we are enabled to draw the following conclusions:

1. That the disease termed *fistula lachrymalis*, is principally derived from the morbid secretion of the glands of Meibomius and the internal membrane of the palpebræ.

2. That the morbid secretion of the eyelids may, for practical purposes, be advantageously divided into four stages, each of which requires a particular treatment.

3. That, to obtain a perfect and lasting cure of this disease in any stage or complication, it is always necessary that the morbid secretion of the palpebræ be corrected not only by means of topical remedies, but of such internal medicines as are calculated to correct the particular predisposition from which such morbid secretion is derived, or kept up.

4. That in the first stage of this disorder, the injection of warm water through the *puncta lachrymalia* until it pass freely into the nose, in addition to the remedies before-mentioned, is sufficient for the removal of it.

5. That in the second stage in which the lachrymal sac is moderately dilated, the cure of the disease is obtained by simply puncturing the sac, and placing a style in the nasal duct along which the tears descend into the nose, employing at the same time all the other means for obtaining a suppression of the morbid secretion of the eyelids.

6. That in the third stage, in consequence of the great dilatation and atony of the sac, as well as of

the fungus and ulcerated state of its internal membrane, it is absolutely necessary to lay it open through its whole extent, in order to be able to remedy the causes which aggravate the disease in this stage, precisely as in the treatment of fistulous and fungus ulcers in general.

7. That the *fistula lachrymalis*, accompanied with caries and erosion of the *os unguis*, and of that portion of the pituitary membrane which covers it, together with an obliteration of the nasal canal, provided the caries has not extended too deeply within the ethmoidal cells in unhealthy constitutions, the cure may be effected without any weeping of the eye remaining.

8. That the same advantage may be obtained in the fourth stage by perforating the *os unguis*, provided this be done by the actual cautery, and consequently include the destruction of that portion of the pituitary membrane which covers the *os unguis* internally.

CASE I.

A young lady of Pavia, 17 years of age, of a delicate and sensible fibre, began to experience an unusual difficulty in opening the right eye, in consequence of a preternatural tumefaction of the palpebræ of that side, accompanied with a weeping of the eye, and an accumulation of gum, especially in the morning. She was directed to wash the eye frequently with elderflower water. After four months the disease had greatly increased, and on being consulted, I found, that on pressing the

lachrymal sac, a very considerable quantity of puriform matter issued from the *puncta*. On everting the palpebræ of the right side, the internal surface, especially of the inferior eyelid, near its margin, was evidently more tumefied than natural, and had a villous appearance, the glands of Meibomius were more turgid and elevated than usual, and interwoven with small varicose vessels: which appearances were not perceptible, or in a very small degree, upon the internal surface of the left side. The right ala of the nose in this young lady also had been for several months very red and swollen, and the internal surface of the corresponding nostril incrusted and dry.

Having pressed out all the puriform matter contained in the sac, I attempted to inject some water through one of the *puncta lachrymalia*, and at the fourth attempt the water passed into the nose and fauces. And as the lachrymal sac was not perceptibly more distended than natural, I directed all my attention to divert the discharge, to diminish and correct the morbid secretion, and at the same time to strengthen the varicose vessels of the internal membrane of the affected eyelids.

I therefore ordered the patient to take, in the course of the day, a pint of milk whey, with a dram of the crystals of tartar, and half a grain of tartarized antimony, which did not disagree with the stomach, and procured one, and sometimes two copious evacuations every day.

As a local application, a small quantity of the ophthalmic ointment of Janin was introduced between the eyelids, prepared exactly according

to the author's formula. The irritation which this remedy produced in the present case was so violent, that in little more than an hour, notwithstanding the parts were repeatedly washed with milk, the eyelids became enormously swollen and inflamed. During the inflammation, which continued four or five days, the puriform discharge was entirely suppressed, nor could any thing be forced from the sac, though pressed upon at different intervals, except pure tears.

On the subsidence of the inflammation, the *puriform discharge of the palpebræ* returned nearly as before. The ophthalmic ointment was again applied, which was rendered less active by adding a double quantity of lard, of which a portion equal to a grain and a half of wheat was applied morning and evening, the lachrymal passages being previously cleared by an injection of plantain water with a small quantity of spirit of wine added to it, and a few drops of the vitriolic collyrium were instilled into the eye three or four times a day.

By this treatment, at the end of three weeks, the puriform discharge was greatly diminished, and consisted of little more than tears rendered turbid by mucus, and the right ala of the nose was no longer incrusted, but resumed its natural appearance. The internal membrane of the eyelids became gradually pale and smooth, the glands of Meibomius recovered their natural size, and the varicose vessels disappeared; the use of the whey with the antimon. tart. was now suspended.

About the fortieth day, on pressing upon the sac, there only issued from it pure tears, and the

injection passed with the greatest facility from the *puncta lachrymalia* into the nose. The tears, however, continued to meet with some obstruction, and the patient, on exposing herself to cold air, or reading by the light of the candle, was obliged to wipe the eye frequently. As this inconvenience did not appear to arise from atony of the sac, and as the patient constantly complained of a fulness of the pituitary membrane of the right nostril, by which the extremity of the nasal canal suffered some degree of constriction, I ordered her to draw up her nostril frequently in the course of the day the vapour of vinegar and water, and to take a little snuff. This expedient succeeded very well, for in ten days the discharge from the nose was re-established, and the weeping of the eye entirely ceased.

CASE II.

Maria Bordoni, of S[t] Christina, a girl 12 years old, who had been subject in her infancy to frequent attacks of ophthalmia, in one and sometimes both eyes, was affected for eight weeks with a weeping of the right eye, and a considerable discharge of apparently purulent matter. She was brought by her parents to the hospital, not so much on this account, as in consequence of a small hard, red, and painful tumor which had made its appearance, within six days, between the internal angle of the eye and the nose.

The edges of the eyelids of the right side were considerably tumefied, their internal surface red,

and presenting a fungus appearance, and the glands of Meibomius greatly increased in size.

A poultice of bread and milk was applied upon the tumor, as the membrane of the sac appeared to be in a state approaching to suppuration; in a few days, however, the inflammation was dissipated, the tumor subsided, and the *puncta lachrymalia*, which before appeared to be retracted towards the caruncle and were concealed, now separated from the commissure of the palpebræ, and resumed their natural position. On pressing now upon the lachrymal sac, the puriform matter issued in great abundance from the *puncta lachrymalia* upon the eye.

I began immediately to employ the ophthalmic ointment of Janin night and morning in a quantity not exceeding the size of a barley-corn. By this application the *puriform discharge of the palpebræ* was at first increased, but in the course of a month diminished so considerably, that there only issued from the sac a diluted mucus. As soon as the edges and internal surface of the eyelids had recovered their natural state, I began to inject through the *puncta lachrymalia* plantain water, with a little of the vitriolic collyrium added to it, which had been filtered, and the injection passed into the nose. The child was treated in this manner for twenty days more, and then discharged from the hospital perfectly cured.

CASE III.

A peasant boy, 10 years of age, after a variolous metastasis to the eyes, with which he had been

attacked two years before, was affected with a weeping of both eyes and a gumming of the eye-lids. The palpebræ were thickened and deprived of their lashes, and their internal surface was of a dark red colour, and had a villous appearance; the glands of Meibomius were more elevated than usual, and on pressing the sac on each side, which, however, did not appear to be more distended or elevated than natural, a considerable quantity of curdy, yellowish, puriform matter issued from the *puncta*. This child had, what is commonly called, a gross habit of body.

I began the treatment, by ordering ten ounces of the decoction of the triticum repens, a dram of the crystalli tartari, and half a grain of the antimonium tartarizatum, to be taken every day at intervals; and if the medicine should purge him too much, he was directed to take only half the quantity for a few days following. I directed also that the ophthalmic ointment of Janin should be applied morning and evening between the palpebræ of both eyes, which, as usual, considerably increased the secretion of puriform matter. Finding that at the end of two weeks the discharge did not diminish, I made a seton in the neck, which presently suppurated and greatly relieved the eyes. From this period, by continuing the application of the ophthalmic ointment, and frequently purging the patient with small doses of the antimonium tartarizatum, the puriform discharge gradually diminished, the edges of the eyelids subsided and recovered their natural flexibility, and the internal surface began to assume a pale colour, and to lose

its villous appearance. The daily and frequent use of the vitriolic collyrium, and the injection of plantain water with a little spirit of wine through the *puncta lachrymalia*, was never omitted. The injection at first, passed with some difficulty, but afterwards descended freely into the nose on both sides; and towards the end of the third month the child left the hospital completely cured.

CASE IV.

Rosa Fioroni, a peasant woman, aged 48, of Sartirana, after having suffered several attacks of obstinate ophthalmia, was affected with a gumming and weeping of the left eye, which she endured for a very long time. When I saw her for the first time, I found the edges of the eyelids of the left side thickened, and reddish, and the Meibomian glands tumid. The lachrymal sac, however, notwithstanding the inveteracy of the disease, was little more distended and elevated than natural. The treatment was begun by the application of Janin's ointment night and morning, and injections of warm water through the *puncta lachrymalia*. In the course of three weeks the state of the eyelids was amended, and the puriform secretion evidently diminished; but the water thrown through the *puncta lachrymalia* passed with considerable difficulty into the nose; I therefore thought it necessary to subject the patient to the operation.

I made a small puncture in the upper part of the lachrymal sac, through which I introduced a fine probe, and having passed it along the nasal canal,

so as to penetrate the nose, I withdrew it, and placed the style for conducting the tears in it. On the fifth day after the operation, the style being removed, I injected water through the sac, which descended freely into the nose and fauces, and afterwards replaced it. A few days after the operation, the patient informed me, that notwithstanding the presençe of the instrument in the nasal canal, she had not suffered so much inconvenience from the weeping as before. Towards the end of the second month, by the steady use of the ophthalmic ointment, the edges of the eyelids had entirely lost their turgescence and rigidity, and a small quantity of viscid matter only was discharged from them. At the end of two weeks more, the eye was dry and the corresponding nostril moist, certain proofs that the tears and small quantity of morbid secretion which remained had a free passage into the nose along the style. She left the hospital some days afterwards, with the direction to wear the instrument for a year at least, and to clean it every three days, which she more than complied with, as she carried it for three years, suffering, as she said, no inconvenience from it. The cure was perfect and durable.

CASE V.

Antonia Mascheroni, of S. Angelo, 40 years of age, presented herself at the school of surgery, on account of a troublesome weeping with puriform discharge of the eyelids, which she had had for several years in the right eye, in consequence of violent

erysipelas affecting the head, and especially the face. The edges of the eyelids on the affected side were tumid and reddish, with a varicose state of the vessels, enlargement of the Meibomian glands, and prominence of the lachrymal sac. I immediately punctured the sac, dilated the nasal canal with a common probe, and placed the style in it as a conductor for the tears. I directed also the application of Janin's ointment between the eyelids night and morning. In a few days there was an evident diminution of the weeping. Every second day the style was cleaned, and on the same account warm water injected into the sac, which passed freely into the nose and fauces. About the fortieth day the gummy discharge and weeping had ceased, and the eye was constantly dry. A week after, the woman left the hospital, being cautioned to wear the style for a length of time, and to clean it twice a week. She carried it for ten months, and suffered no inconvenience afterwards from the complaint.

CASE VI.

Maria Gallotti, of Villareggio, a peasant girl, aged 13, had a weeping and gumminess of the right eye, which she had neglected for a long time. The discharge had increased to such a degree, that in the course of about two years the lachrymal sac had suppured and burst externally three times. Repeated attempts were made to inject water through the *puncta lachrymalia* into the nose, but without success. I therefore made a puncture into the

summit of the sac, and with a fine probe dilated the nasal canal. As I found in doing this, that the duct was narrower than usual, I passed a second probe along it somewhat thicker than the first, and afterwards an elastic gum bougie, which I left in it for some days. Although, during the operation, the girl did not appear to suffer much, yet on the following day the palpebræ and cheek were inflamed. By the application of a poultice of bread and milk, and a gentle purge, she became easy on the fifth day. On the eighth, I withdrew the bougie from the canal, for the purpose of introducing the style for conducting the tears, which descended into the nose with the greatest ease. From this period, the diminution of the weeping was most evident, notwithstanding the presence of the instrument in the canal. The constant application of the ophthalmic ointment morning and evening corrected the morbid secretion of the eyelids. Five weeks after the operation, the girl quitted the hospital, wearing the style. A year afterwards, she returned to beg permission to have it removed entirely, which was granted, as the natural and sound state of the parts and the absence of weeping shewed that the tears had regained their free course into the nose. At present she enjoys the most perfect health, six years having now elapsed since her cure.

CASE VII.

Giuseppa Beretta, 14 years of age, of Guissago, was affected with weeping and puriform discharge of the left eye for three years, with evident tumo-

faction of the lachrymal sac, from which I considered every attempt by means of injections through the *puncta lachrymalia* useless. The sac being punctured, I found much difficulty in passing a fine probe through the nasal duct into the nostril, in consequence, I believe, of the unusual narrowness of the osseous, rather than the membranous, part of it. By patience and gentleness I finally succeeded, and to avoid giving any further irritation, I cut off the portion of probe which remained out of the sac. The eyelids, however, were inflamed, and a small abscess formed in the lower, which being opened, the affected parts recovered their natural condition. Ten days after the operation, the portion of probe placed in the nasal duct had become moveable in all directions, and gave me an opportunity of withdrawing it easily, and of substituting for it the conducting style. I began now to introduce between the eyelids the ophthalmic ointment, in order to suppress the morbid secretion, which had the usual success. The weeping diminished daily, and it was evident that the tears followed the course of the style into the nose. Two months after the operation, the girl left the hospital, retaining the style, which she was able of herself to clean and replace every third day. She wore it for two years without the least inconvenience; after which she was perfectly well.

CASE VIII.

Teresa Barbieri, of Pavia, 50 years of age, had a weeping of the right eye from her infancy. As

she advanced in years, the disease became a true *fistula lachrymalis*, with enormous distension and ulceration of the sac. The simple puncture of this receptacle of the tears being insufficient for the purpose of using proper applications to it, I made a complete longitudinal division of it; and having dilated the nasal canal by means of a probe rather thicker than ordinary, I seized the opportunity of introducing a wax bougie, with a thread affixed to it, and pushed it so as to be concealed at the lowest part of the sac, and to maintain the nasal duct dilated, without occupying the cavity of the former, which was filled with soft lint. At the subsequent dressings, the lint was spread with an ointment, composed of red precipitate, in order to destroy the fungus state of its internal membrane, and dispose the part to heal gradually. In the mean while, the application of the ophthalmic ointment between the eyelids night and morning was employed with a view to remove the morbid secretion. At the end of five weeks from the day of the operation, as the internal surface of the sac was almost healed, and the sac itself nearly reduced to its natural size, I withdrew by means of the thread the bougie from the nasal duct, and substituted for it the style for conducting the tears. After this the weeping speedily ceased, and the progress of the cure was so rapid, that at the end of three weeks more the patient quitted the hospital in the best state of health, wearing the style, being cautioned not to remove it entirely in less than a year. She wore it for six years successively, and it was only after repeated importunities that she was prevailed

on to remove it. In doing this, the surgeon Molina, the assistant of this school, found an unusual difficulty on account of the extremity of the style projecting into the nostril being covered by an earthy incrustation. This irritation, however, produced no unpleasant consequences, and the tears continued to flow into the nose after the style was removed as freely as before.

CASE IX.

An elderly woman, 55 years of age, was admitted into the practical school of surgery from the country, on account of a small and somewhat indolent tumor, the size of a small nut, which she had had for a considerable time, situate between the internal angle of the right eye and the nose. In pressing upon this tumor, which readily yielded, a considerable quantity of greenish offensive matter issued from the corresponding nostril; and a small quantity of the same viscid fluid from the *puncta lachrymalia* upon the eye.

The woman stated, that she had been affected with this disease during fifteen years, and that it began with an immoderate gumming of the eye, which she had never attended to; that the tumor had frequently burst externally, attended with relief, and closed again spontaneously; and that within the last year, after much swelling of the whole face and violent pains within the root of the nose, she was relieved by the discharge of a considerable quantity of fetid matter from the right nostril, but that notwithstanding the tumor continued to increase

every day more and more. The edges of the eyelids of the right side were rigid, indurated, red, and in a fungus state internally, and the sebaceous glands enlarged.

I pushed the point of a bistoury immediately below the tendon of the *orbicularis palpebrarum*, and directed the instrument against the *os unguis*; then following the fold of the lower eyelid, I laid the sac completely open. In the act of dividing it a considerable quantity of matter gushed out; opposite the incision I found the *os unguis* wanting, and round this part there were portions of the ethmoid bone denuded. The opening which was formed by the deficiency of the *os unguis* was large enough to admit a thick writing quill, and communicated directly with the right nostril. The pituitary membrane around this opening was equally destroyed; I took great pains to discover the nasal canal, but without success. The cavity of the tumor was filled with lint, and a poultice of bread and milk applied upon the eyelids, in order to soften their hard and rigid edges.

On removing the dressings the following day, I found the whole internal surface of the sac in a fungus state. I filled the cavity very exactly with lint dipped in the caustic liniment mentioned in the preceding case; and, in order to prevent it from passing into the nostril, I previously introduced into the opening formed by the deficiency of the bone, a small sindon with a waxed thread passed through the centre of it, similar to that which is used after the operation of trepanning the cranium. Besides a copious discharge of matter from the en-

larged sac, pieces of slough and sometimes particles of carious bone came away at each dressing. The parts where the fungus was more prominent than the rest, were sprinkled with the hydrargyrus nitratus ruber alone, or mixed with alum, and occasionally touched with the argentum nitratum.

By continuing this treatment for thirty days the ulcer assumed a healthy and granulating appearance, and had a tendency to contract in every direction. The treatment afterwards consisted in dressing the wound with dry lint, and occasionally touching the edges of the large orifice, leading from the sac into the nostril, with the argentum nitratum.

Towards the sixtieth day the ulcer was completely healed, and the sac nearly reduced to its natural size, and by the uninterrupted use of the ophthalmic ointment of Janin, morning and evening, and the vitriolic collyrium three or four times a day, the palpebræ had recovered their natural healthy condition. The edges of the external orifice of the sac were now permitted to close, the tears being directly discharged into the nostril through the large opening formed in the posterior part of the sac by the deficiency of the *os unguis*, and the woman left the hospital perfectly cured.

CHAP. II.

OF THE HORDEOLUM*.

The hordeolum, is strictly speaking, only a small boil which forms upon the margin of the palpebræ, most frequently towards the great angle of the eye.

This small tumor, like the furuncle, is of a dark red colour, highly inflamed, and much more painful than might be expected from the smallness of its size; arising partly from the violence of the inflammation, by which it is produced, and partly from the exquisite sensibility and tension of the skin covering the edges of the eyelids. Hence it is that the hordeolum, in persons of delicate and sensible habits, frequently occasions fever and restlessness; its suppuration is slow and imperfect, and when matter is formed in it, it does not appear disposed to burst.

This particular form of inflammation, which might be called *furuncular*, differs in several respects from common *phlegmonous* inflammation. The former commences in the skin, extends itself downwards into the subjacent cellular membrane, and produces a more or less extensive destruction of it; the *phlegmonous* inflammation, on the con-

* Κριθη, stye, stithe, or stian.—Trans.

trary, originates in the cellular membrane, the vitality of which it does not destroy, and is afterwards propagated externally to the skin. The *furuncular* inflammation is quickly arrested, and forms a small, circumscribed, hard, and very painful tumor, which, though elevated upon the skin, does not contain extravasated coagulable lymph, but consists entirely of mortified or disorganized cellular membrane; while on the other hand the *phlegmonous* inflammation is disposed to propagate itself extensively through the cellular membrane, into the cells of which a considerable quantity of coagulable lymph is incessantly poured, occasioning the tumefaction. In consequence of the furunculus being completely filled with mortified or disorganized cellular membrane, suppuration either does not take place in it, or very imperfectly; and never in the centre of the tumor, but at its circumference, where it is in contact with the sound parts; while in the phlegmon a true and complete suppuration is formed precisely in the centre of the inflamed cellular membrane, which, when the matter is discharged, spontaneously contracts and recovers its natural state and functions. In the second stage of the furunculus, the skin which covers it ulcerates and bursts in one or more points, and discharges a very small quantity of serous fluid, and the small portion of mortified cellular membrane, which formed the body and base of the tumor, then comes away in the form of an extraneous substance, and the cavity which remains closes and heals in a short time. All these phænomena, peculiar to the *furuncular* inflamma-

tion, are common to the hordeolum, the nature of which does not consequently differ from that of the furunculus.

The treatment of the hordeolum therefore, as well as that of the furunculus, when the tumor occupies the subjacent cellular membrane, forms an exception to the general rule, that the best termination of inflammatory tumors is that of resolution. For whenever the *furuncular* inflammation has extended so deeply as to destroy a portion of the cellular membrane, the resolution of the tumor cannot in any manner be effected, or at most imperfectly; hence this mode of termination would be rather injurious, since a greater or smaller portion of the cellular substance deprived of vitality would be left; which sooner or later must occasion a reproduction of the disease, or degenerate into a hard and indolent substance, which would deform the margin of the eyelid.

The resolution of the incipient hordeolum may be accomplished in that stage of it, in which the inflammation affects only the skin, and not the subjacent cellular membrane, as happens on the first appearance of the disease; in which case repellent applications are advantageous, especially the repeated application of cold to that part of the margin of the eyelid, which is beginning to appear red, by means of a convenient piece of metal, as the extremity of a key, a piece of money, or, what is still preferable, ice. But if the disease has already affected and destroyed a small portion of the subjacent cellular membrane, every repellent application is not only useless but injurious, and

recourse should be had to the assiduous use of local emollient and anodyne remedies.

In the second stage of the disease, therefore, the *hordeolum* and palpebræ should be covered with a warm poultice made of bread-crumb boiled in new milk, with a little saffron or melon-pulp added to it, and renewed every two hours, or even oftener in the winter season.

The appearance of a white spot upon the most elevated part of the hordeolum should not induce the surgeon to be hasty in opening it, in order to give issue to the very small quantity of serous fluid which is formed between the skin and the diseased and mortified cellular membrane. It will be better that he should wait until the skin surrounding this whitish speck become considerably thinner, that it may burst and open itself sufficiently to allow not only of the small quantity of serum, but of the portion of corrupted cellular membrane, forming the principal part of the tumor, to be easily discharged. If the portion of membrane be slow in coming away through this aperture, the surgeon, by pressing lightly upon the eyelid, at the base of the tumor, should force it out; by this means all the symptoms of the disease will disappear, and the cavity left by the mortified cellular membrane, forming the centre of the tumor, will be entirely closed and healed in twenty-four hours.

It sometimes, though rarely, happens, that this process of nature, designed to separate the mortified portion of the cellular membrane from that which is sound, is but imperfectly performed, and that a small portion of yellowish disorganized cel-

lular substance still remains at the bottom of the little cavity, which by adhering prevents the small tubercle from being completely healed. In these cases, in which little or no advantage can be derived from continuing the application of the emollient poultice, the surgeon should touch the bottom of the cavity with the point of a camel's hair pencil dipped in the sulphuric acid, one or more times, until this remaining portion of cellular membrane deprived of life be also completely detached from the sound parts and expelled; after which the small cavity that remains will very speedily close.

If, after the cure of the hordeolum, the eyelid upon which it was situated, remain a little tumefied and edematose, it may be easily removed by the application of the aqua litharg. acet. comp. with a little spirit of wine added to it.

There are some persons who are particularly subject to this disease. This arises most frequently from sordes in the primæ viæ, in consequence of their living on acrid and irritating food, and indulging in spirituous liquors. Such persons should observe a better regimen than that which they have been accustomed to, and should take occasionally a pint of the decoction of the triticum repens, or of milk whey with a grain of the antimon. tartariz. in divided doses, particularly when symptoms of indigestion of the stomach are present. As a local and preservative remedy, the vitriolic collyrium may be dropped into the eye, and the eyelids washed with it once a day.

CHAP. III.

OF ENCYSTED TUMORS OF THE EYELIDS.

ENCYSTED tumors are very frequently met with in the eyelids. Some writers indeed pretend that they occur more frequently in the eyelids than in other parts of the body, in consequence of the former being more abundantly furnished with sebaceous glands, as those of Meibomius, from the preternatural increase of some of which, they have presumed these follicular tumors to originate.

As such a discussion is of no practical advantage, I willingly omit it, and shall merely observe, that the glands of Meibomius occupy the edges of the palpebræ, while the small encysted tumors do not appear more frequently in this than in other parts of the eyelids, where these glands do not exist; and also, it is proved, that follicular tumors originate as well from the cells of the reticular membrane, as from these glandular bodies.

The encysted tumor of the eyelids in its commencement is not larger than a millet-seed or a small pea, and it is only after a considerable time that it arrives at the magnitude of a bean, and sometimes of a filbert. These tumors do not in general excite pain, but when they acquire a considerable bulk, they occasion some uneasiness by preventing the free motion of the eyelid, producing

a partial depression of it, or pressing upon the globe of the eye.

With respect to the seat of these tumors, it appears to me, from numerous observations, that they are, from their commencement, most frequently less covered by the internal membrane of the eyelids, than by the integuments and muscular fibres; so that their bases are in general so superficially placed upon the internal surface of the former, that when they are everted, these tumors are seen as it were uncovered, and the yellowish follicule appears transparent through the fine internal membrane of the palpebræ which covers them.

The frequent unavailing attempts which I have made to obtain a resolution of these encysted tumors on their first appearance, sometimes by employing the remedy so much extolled by Morgagni*, consisting of the aqua reginæ, or elder-flower water, and a moderate quantity of the aqua ammoniæ, so as not to excite any heat or uneasiness in the skin of the eyelids; at other times by applications of resolvent gums and local mercurial frictions; have convinced me that the only effectual method of curing the disease, especially when it has existed for some months, is the extirpation of the tumor.

And as these follicular tubercles are generally situated much more towards the internal than the external surface of the palpebræ, and even adhere so closely to the internal membrane, that

* Epist. Anat. xiii. 2.

in attempting to extract them by dividing the skin, there is a risk of piercing through the eyelid, I am authorized, from observation and experience, to believe that the best method of removing these tumors is to extract them from the internal surface of the eyelid, although it has been even lately asserted to the contrary by surgeons of high and deserved reputation. For, by extracting the small follicular body from the internal surface of the eyelid, the incision which is required is entirely superficial; the separation of the cyst from the surrounding parts is easily effected; the after-treatment is of no importance; and there does not remain the smallest vestige upon the integuments of the palpebræ, either of the preceding disease, or of the operation which has been performed.

The only exception of any importance which can be offered to this method of treatment, is in the case where the encysted tumor is so situate, that the eyelid cannot be sufficiently everted to expose the base of it, and admit of its being completely removed: as for instance, where it is so placed immediately under the external or internal commissure of the eyelids, as to extend under the arch of the orbit, a circumstance which has occurred to me oftener than once.

It may not be improper on this occasion to relate the history of a case of encysted tumor deeply seated in the orbit, which was treated by Messrs. Bromfield and Ingram. This tumor, after having caused pain at the bottom of the orbit of the eye during several years, diminution of sight,

and afterwards total blindness, ultimately forced the eyeball out of its socket, and produced an eversion of the lower eyelid. On examining the protruded eyeball with the finger, these surgeons, perceived, on the external and lower side, a fluctuation, which they imagined to arise from an encysted tumor; and it was agreed that it ought to be opened. For this purpose Mr. Bromfield, having directed that the lower eyelid should be pressed upwards as much as possible, and held very firmly in that position, divided the integuments with a scalpel, in the direction of the inferior edge of the orbit, beyond the conjunctiva, and of a sufficient extent to enable him to introduce his finger behind the ball of the eye, precisely upon the seat of the cyst. The operator, guided by his finger, penetrated the cyst, and a pellucid fluid issued from it, sufficient in quantity to fill a small wine-glass. Having paused a little, he drew the empty cyst towards him by means of two small hooks, removed it, and filled the wound with soft lint. In 24 hours the head and neck became enormously swollen; this symptom however was relieved, by the use of internal antiphlogistic remedies and mild applications, and the wound healed in less than a month. The lower eyelid gradually returned to its natural position, and the eyeball retired within the orbit. The narrator adds, that having an opportunity of seeing this patient again, five months afterwards, he found that he could distinguish, with the eye which had been so dangerously affected, a strong light from darkness. *Medical Observ. and Enquiries, vol.* iv.

page 371. A case similar to this is related in the treatise on the diseases of the eyes, by Saint-Yves, chap. 21, under the title, *Opération d'une tumeur singulière dans l'orbit.*

But these are rather to be regarded as encysted tumors of the parts in the vicinity of the eyelids, of which I shall speak more fully hereafter, than of the eyelids themselves; and even if it were desirable to class these particular cases with the latter, they would not in the least detract from the propriety and utility of the method of treatment here recommended.

Supposing then the encysted tumor to occupy the upper eyelid, the patient being seated and his head firmly supported, an able assistant, placed behind or on one side of him, should turn out the lid, in such a manner that by placing the point of the forefinger of one hand upon the tumor, and the forefinger of the other covered with a piece of fine rag, upon the everted margin of the palpebra, the follicule may be made to project as much as possible from its internal surface. The surgeon standing before the patient, with a lancet or small convex-edged scalpel* should, with the hand unsupported, divide the fine internal membrane of the palpebra covering the follicule, in the direction of the edge of the eyelid, and to a sufficient extent to allow of the tumor passing easily out and projecting beyond its internal membrane: the follicule being then taken hold of with the forceps, or a small hook, should be drawn out and

* Tab. III. fig. 13.

completely separated from all its attachments to the surrounding parts, either by the scalpel or by a stroke of the curved scissors*. The eyelid being then returned to its situation should be covered with a compress dipped in the aqua lithargyri acetati comp. supported by the *monoculus* bandage.

If the encysted tumor be situate in the lower eyelid, the assistant should place himself before the patient, and the surgeon behind, or on one side, as he may find most convenient, and proceed to the operation in the manner already described. In operating on children, whether on the upper or lower eyelid, the most convenient position is to lay them on a table of a convenient height, with the head raised by a pillow, and the hands and feet firmly held by assistants.

When the surgeon is deprived of an intelligent assistant, the operation may be performed in the following manner. The operator turning out the eyelid with the point of the forefinger of his left hand, and placing the extremity of his thumb upon its everted margin, in order to hold it more securely, and to make the root or base of the follicule project as much as possible from the internal surface of it, with a lancet or small convex-edged scalpel in the right hand, should make a slight incision through the internal membrane upon the tumor, in the direction from one canthus of the eye towards the other, and with the point of the instrument, insinuated obliquely between the cyst and membrane of the pal-

* Tab. III. fig. 4.

pebra, should separate it from all its surrounding adhesions. Having done this, with the point of the index finger of the left hand, which had been placed from the beginning behind the tumor, he should press upon it so as to make the cyst pass completely through the incision, and be raised in a great measure above the internal membrane of the eyelid covering it. Then laying aside the scalpel, and taking hold of the curved scissors, he should include the base of the follicule in them, and at one stroke separate it entirely from its remaining attachments, and immediately return the eyelid to its natural position.

In employing this method of extirpating encysted tumors of the eyelids, it is not necessary to be scrupulous about the separation of the very minute particles of the cyst, when it is opened or bursts during the operation. For when the principal part of the follicule is removed, and the eyelid restored to its situation, the tears, especially if the lower eyelid be operated on, enter and fill the cavity left by the tumor, and consequently prevent the lips of the wound from uniting by the first intention. When the process of suppuration therefore is established, there is no necessity to employ any other means, as the small particles of the follicule which have accidentally remained behind, adhering to the bottom of the ulcer, are gradually loosened and thrown off with the matter which is discharged from it*. If, however, this

* This is to be understood of the minute and almost imperceptible particles of the cyst; for the capsule being carefully separated from all its surrounding adhesions, and made to project

process of nature should not speedily take place, and the integuments do not readily subside and contract, in consequence of having been too much distended during the continuance of the disease, the cure may be accelerated by everting the eyelid, and touching the bottom of the cavity of the wound with the argentum nitratum, taking care to wash the eye immediately afterwards with new milk. In general, however, this expedient is unnecessary, as every external vestige of the disease commonly disappears in the course of four days from the operation, and on everting the eyelid, the part where the incision was made is found covered with a mucous matter, the bottom of the small cavity nearly on a level with the internal surface of the eyelid, and in the course of eight days it is perfectly healed.

It is very singular that some of the most distinguished writers in surgery of the present day should seem so adverse to this method of removing encysted tumors of the eyelids, while they recommend the extirpation of similar follicular bodies seated on the cheek from the inside of the mouth, not only to avoid an external wound of the parotid duct, but, because, according to their own observations, these tumors are much more speedily cured when they are removed from the inside of the mouth, than when the operation is performed externally. The same advantage of a

upon the internal surface of the eyelid by the operator pressing upon it behind with the point of his finger, the base of the cyst is so completely removed by the curved scissors, that no considerable portion of it can remain behind.

speedy cure is equally obtained in the extirpation of encysted tumors from the internal surface of the palpebræ, which is not less authorized by practice, and is more easily executed.

I shall conclude this chapter with subjoining some observations relative to a particular species of encysted tumor of the eyelid, which in some respects differs materially from that which I have already spoken of, and which is not unfrequently met with in practice. This is a small, hard, and indolent tubercle, generally rather larger than a millet-seed, which arises precisely upon some part of the edge of the eyelid among the cilia, and is of a white colour, resembling the white of a boiled egg. When this tubercle is of long standing, it contains a substance exactly similar to that of the albumen ovi when boiled, and is merely covered with a very thin and transparent skin, which is closely united with the dense matter contained within it.

M. Aurelius Severinus*, who has given a more accurate description of this disease than any other writer, says: *Tuberculi cujusdam exigui in clivo palpebræ ciliari nascentis, et se cum pilis oblique proferentis; quo magnitudine, duritieque mihi sementulam refert, si tantummodo flavum hujus colorem in exquisitum alborem intelligas mutatum.—Corticulam duriorem, ac ferme corneolam huic tuberculo adverti; usque adeo ut medicamentis acerrimis, id est liquidis causticis, tentatum, nullam vel tactûs vel co-*

* De novis observ. abscess. § De miliolo exterioris palpebræ tuberculo.

loris mutationem senserit.—Continet molleculam chartæ bombicinæ madidæ similem portiunculam.

The situation of this tumor on the very edge of the eyelid, the extreme fineness of the skin which covers it, as well as the smallness of its size, and the hardness of the matter which it contains, render it most convenient to remove it from the external surface of the eyelid. This may be easily executed by including it exactly its base, with the curved scissors, or by passing the point of a lancet through the root of it, so as to remove the whole tubercle close to the edge of the eyelid. When the bleeding has ceased, the divided parts may be covered with a small piece of court plaister. On the following day the wound may be touched with the argentum nitratum, and the rest of the cure left to nature. On the exfoliation of the eschar the part will be found completely healed.

CASE X.

A child, the daughter of a nobleman of Pavia, had for a year and a half an encysted tumor on the upper eyelid of the right side, of the size of a small pea.

For the purpose of extirpating it, I placed the child upon a table of a convenient height, with the head supported upon a pillow, and the arms and legs firmly held by two assistants. I desired the assistant situated behind the head of the child to evert the eyelid by placing the point of the forefinger of his left hand upon

the integuments and the tumor, and one finger of the right hand covered with a piece of fine linen upon its everted margin.

Having placed myself on the side of the patient, with the hand unsupported, I divided the internal membrane of the palpebra longitudinally, at the part covering the base of the tumor, which was distinguishable by its yellowish colour. Through this incision, which was little more than three lines in length, almost the whole of the follicule immediately passed out; I took hold of it with the forceps, and having raised it, completely detached it. The eyelid was then replaced, and covered with a compress dipped in the aqua litharg. acetat. comp. and a bandage.

The child, which had been unruly, became quiet, and almost immediately fell asleep. On the third day the eyelid was a little tumefied and inflamed; I directed a small bag of emollient herbs boiled in milk, to be applied upon it, and the child remained out of bed as usual, and was perfectly cheerful. On the seventh day the tumefaction of the eyelid had entirely subsided, and on carefully everting it, I found the wound perfectly healed. There was not the smallest vestige of the disease on the external part of the eyelid.

CASE XI.

Signor Luigi Gozzani, of Novara, a medical student in this university, desirous of being freed from the inconvenience and deformity occasioned by an encysted tumor, nearly the size of a bean, situated

upon the left superior eyelid, submitted to the operation in the presence of a great number of his fellow-students in medicine and surgery.

Having placed himself in a chair, I turned out the upper eyelid with the point of the forefinger of my left hand, and retained it in this position by applying the point of my thumb upon its internal margin. I made an incision with a lancet in that part of the internal membrane of the palpebra, which covered the base or root of the yellow follicular tumor, and carrying the point of it circularly between the tumor and the internal membrane of the eyelid, separated it entirely; then, by making a greater degree of pressure on the tumor with the point of the forefinger of my left hand, I forced it almost entirely out through the incision, and by including its base in the curved scissors, removed it at a single stroke, and returned the eyelid to its situation.

This gentleman said, that the pain attending the operation was very trifling, and not greater than that occasioned by bleeding: during the two following days the eyelid was slightly inflamed and swollen, and bags of emollient herbs were applied upon it. On the fifth day the patient found himself completely well, without its being possible to distinguish on which side the tumor had been situated; and on the seventh he returned to his studies as usual.

CASE XII.

A poor woman, 40 years of age, came to the practical school to consult me on account of an

encysted tumor, the size of the tip of the finger, which she had had for several years upon the left superior eyelid towards the external angle, and which for some weeks had occasioned an unusual sense of weight, and prevented the eye from being sufficiently opened. I proposed the operation, to which she assented, but for some particular reasons refused to remain in the hospital after the operation, proposing to follow in other respects whatever I might direct.

The patient being seated, I everted the eyelid with the forefinger and thumb of my left hand, holding the point of the forefinger firmly against the tumor, in order to make it project as much as possible, and having slightly divided the internal membrane upon the base of it with a convex-edged scalpel, the follicule immediately passed out of the incision. I carefully separated it from the surrounding parts, by insinuating the point of the scalpel obliquely, and carrying it round between the follicule and internal membrane of the palpebra, and then embracing the tumor as closely as possible to the substance of the eyelid with the curved scissors, I removed it at one stroke. The eyelid was then returned to its situation, and covered with a dry compress and bandage, and the patient returned home.

I waited in vain for a week, flattering myself that the patient would give some account of herself, and at length she was found, and appeared perfectly well. On being asked what inconvenience she had suffered after the operation, she replied none, except a little swelling and inflammation of

the eyelid during the first three days; which, however, had not prevented her from attending her family affairs.

CASE XIII.

In the act of dividing the internal membrane of the palpebra for extracting an encysted tumor, of a size rather larger than a pea, situated on the lower eyelid of a child 10 years of age, I accidentally opened the cyst at the same time, from which the whole of its contents, consisting of a little milky concrete substance, was immediately discharged. I laid hold of the cyst in several places with the forceps, first freeing it as much as possible from its attachments to the surrounding parts; but it eluded me, nor could I by any means detach or remove it with the curved scissors close to the substance of the eyelid, with such exactness, as not to leave some small particles of it adhering to the bottom and sides of the cavity. After having removed, however, a small portion of the edges of the incision made in the internal membrane, the eyelid was returned to its situation.

During the two first days the eyelid was a little tumefied and inflamed as usual, and on everting it, towards the end of the fourth day, I found the bottom of the wound covered with a glutinous matter. On the seventh day the cavity was quite superficial, contracted, and nearly healed; and on the ninth the patient was perfectly cured, without any elevation or deformity of the eyelid remaining externally. I might here have related a very considerable number of cases similar to this.

CASE XIV.

A shoemaker's boy had for several years an encysted tumor, nearly in the centre of the right inferior eyelid, which gradually increased to the size of a nutmeg. It began also to produce an eversion of the eyelid and a weeping of the eye.

I removed it from the internal surface of the eyelid in the manner above-mentioned; but as the tumor was full of a milky substance, half concrete and half fluid, in making the incision the cyst was punctured, and the whole of the matter contained in it was immediately discharged. I was unable to separate the cyst from the neighbouring parts with the exactness that I could have wished; I removed, however, as much of it as I could, and returned the eyelid to its situation, in expectation that nature, by means of suppuration, would complete the rest of the cure. During the two following days the eyelid was swollen and inflamed, upon which I applied a poultice of bread and milk. On the fifth day the mucous suppuration commenced, the bottom of the cavity then began to assume a florid appearance, to contract and approach the internal surface of the eyelid. After some days the ulcer became stationary, and there yet remained a little elevation at the part where the tumor had been situated. I turned out the eyelid, and touched the cavity with the argentum nitratum, which only occasioned a temporary heat in the patient's eye, as I took care to drop a little milk im-

mediately afterwards between the palpebræ and eyeball, and continued the use of it for half an hour. On the following day the eyelid became again tumefied and inflamed, and the mucous suppuration appeared again in greater quantity than at first. In the course of eight days more the cavity left by the encysted tumor closed and entirely disappeared, both externally and internally; and the patient was discharged from the hospital perfectly cured, without the least trace of the disease by which he had before been disfigured.

CHAP. IV.

OF THE CILIA WHICH IRRITATE THE EYE.

THIS disease, termed *Trichiasis*, presents itself under two distinct forms: the first is where the cilia are turned inwards, without the tarsus having changed its natural position and direction; the second consists in a morbid inclination of the tarsus, and consequently of the eyelash towards the ball of the eye.

The first form of this disease is very rare, nor has it come under my own observation more than once, and in this instance only some of the hairs had changed their direction. The second species or form of *Trichiasis*, or that which consists in a folding inwards of the tarsus and cilia at the same time, is that which is commonly met with in practice. This may be either complete, affecting the whole of the tarsus; or incomplete, occupying only a certain portion of the edge of the eyelid, and most frequently near the external angle of the eye; sometimes the disease is confined to one eyelid only, at other times it affects both, and occasionally the patient is afflicted with it in both eyes.

To these two species of *Trichiasis* some writers have added a third, which they call *distichiasis*, and which they suppose to be produced by a double and unusual row of hairs. But this third species

is only imaginary, and the reason of such subdivision seems to have arisen from a want of recollecting what was long ago remarked by Winslow* and Albinus † on the natural arrangement of the cilia; that although their roots appear to be disposed in one line only, they nevertheless form two, three, and in the upper eyelid even four ranges of hairs, unequally situated, and as it were confused. Whenever, therefore, in consequence of disease a certain number of hairs part from each other in a contrary direction and are scattered, the eyelash will appear to be composed of a new and unusual row of them, while in fact there has been no change either with respect to their number or natural insertion ‡.

It is not an easy matter to determine precisely what are the causes which sometimes occasion a small number of the hairs to deviate from their natural direction, while the tarsus remains in its position. They are generally attributed to cicatrices which take place upon the tarsus in consequence of previous ulceration, by which the cilia fall off, and those which are naturally growing are prevented from taking their proper direction. But it is proper to remark, that this cause is not the only one, since in the case which occurred to me, two or three hairs were turned inwards against the

* Exposition Anatom. Trait. de la tête, § 278.

† Acad. Annotat. lib. iii. cap. 7.

‡ Maître-Jan made the same observation, a long time ago, as may be seen in his Traité des maladies de l'œil, p. 494.

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eyeball, although there had been neither ulceration, nor cicatrization of any part of the tarsus.

For my own part I am inclined to think, that the small ulcers and cicatrices, which are occasionally formed on the internal margin of the tarsus, rather give rise to the second form of the disease, or the inversion of the edge of the eyelid, and consequently of the cilia towards the ball of the eye. As these ulcers are of a corroding nature, and when neglected destroy the substance of the internal membrane of the palpebræ near the tarsus, it necessarily follows, that in proportion as they heal and contract, they draw along with them and turn inwards the tarsus, and consequently the hairs which are implanted in it. And as these small ulcers do not always occupy the whole extent of the internal margin of the eyelid, but are sometimes confined to a few lines in the middle or extremity, near its external angle: consequently after the cicatrices are formed, the whole of the hairs are not always turned inwards, but only a certain number of them which correspond to the extent of the ulcers previously situated along the internal margin of the tarsus. Indeed in every case of imperfect trichiasis, in consequence of a cicatrix of the internal surface of the edge of the eyelid, a very slight examination will shew, that the tarsus and cilia are every where in their natural situation, except opposite the part where the ulcers had formerly existed; and if the eyelid be everted, it will be evident that the internal membrane near that part of the margin corresponding to the seat of the trichiasis is pale,

rigid, and callous, and that from this contraction the inversion of its cartilaginous border is evidently derived, as well as the morbid inclination of the hairs towards the globe of the eye.

Besides these causes, there are others capable of producing the same injurious effect. In the first place the chronic ophthalmia of long standing, which becomes gradually worse and worse by keeping, as that arising from scrofula or the small-pox, the integuments of the eyelid for a considerable time in a state of distension and œdema, and inducing a relaxation of them; the cartilaginous border of the eyelid ultimately loses a proper and firm support in the integuments, inclines towards the eyeball, and afterwards turns inwards, and draws the cilia along with it in the same improper direction. The same unpleasant effect, independently of the relaxation of the integuments, is frequently produced by a softening of the cartilage of the tarsus, in consequence of a copious and long continued puriform discharge from the ciliary glands, by which the cartilage of the tarsus becomes either wholly or partially incapable of supporting itself erect, or of preserving the curve necessary to its perfect coaptation with the tarsus of the other eyelid; hence the cartilage, either in the whole, or a part of its extent, becomes relaxed and folded inwards, and draws along with it the corresponding hairs against the ball of the eye.

These causes are not unfrequently found combined together, and they are also often accompanied with cicatrices of the membrane which

invests the internal margin of the tarsus. Some* pretend that the trichiasis is occasionally produced by a spasmodic contraction of the orbicularis palpebrarum. But I must confess that this has never come under my own observation, and it is difficult to believe that the spasm of this muscle, however violent, can ever produce a folding inwards of the tarsus and cilia, much less that it should continue to act as a permanent cause of the disease.

The degree of uneasiness which must necessarily result from the hairs perpetually pressing upon the cornea and white of the eye, may be easily calculated even by those who are little acquainted with surgery. To aggravate this evil still more, it very frequently happens, that the hairs bent inwards acquire a much greater length and thickness than those which retain their natural position. And although the disease be confined to one eye, yet from consent, both are usually affected, and the sound eye cannot be moved without occasioning pain in that which is subjected to the irritation and friction of the inflected hairs. In general it may be said that both the eyes in persons affected with this disease are very irritable and impatient of the light. As the patient, in cases of incomplete trichiasis, retains in some degree the power of opening the eyelids for the purpose of seeing, and that most frequently towards the internal angle of the eye, the head and neck are frequently inclined in an awkward manner, producing in children, at length, a distortion of the neck and shoulders,

* Bell's System of Surgery, vol. iii. p. 276.

which is with difficulty corrected, even after the trichiasis is cured. Children besides, impatient of the irritation which the inflected cilia produce, are incessantly rubbing the eyelids, which contributes in no small degree to increase the evils consequent on the trichiasis; particularly the *varicose chronic ophthalmia*, the *nebula*, and *ulceration of the cornea.*

The cure of the second species of this disease, or that which is commonly met with in practice, and which consists in a morbid inclination of the tarsus, and consequently of the cilia towards the ball of the eye, whether in consequence of a cicatrix and contraction of the internal membrane of the palpebra in the proximity of the tarsus, from ulceration of the internal margin of the edge of the eyelid, or in consequence of a relaxation of the integuments, a softening of the tarsal cartilage, or from all these causes combined; is effected by artificially everting the tarsus, and re-establishing it firmly in its natural position, together with the cilia, which were irritating the ball of the eye. This indication is completely answered by the excision of a portion of the skin close to the edge of the eyelid, of such a breadth and extent that when the cicatrix is formed, the tarsus and margin of the eyelid may be turned outwards, and sufficiently separated from the eyeball, and may find a point of support in the cicatrix of the integuments sufficiently firm to retain them in their natural position and direction. After so many useless attempts, I do not believe that there are any among modern surgeons, who, with a view to the radical

cure of this disease, place any confidence of success, either in the mere evulsion of the morbidly inflected hairs, in bending them outwards, and retaining them by means of adhesive plasters, or in plucking them out and destroying their roots with caustic or the actual cautery; much less in extirpating the edge of the eyelid along with the hairs, or dividing the orbicularis muscle on the internal surface of the eyelid, under the supposition that the disease is sometimes produced by a spasmodic contraction of it. All these hypothetical methods have been rejected from practice, either as insufficient, or dangerous, and rather calculated to aggravate than cure the disease, or to occasion affections of the eyelids, no less serious than the trichiasis itself*.

The most efficacious method for the complete cure of this disease, which has been hitherto employed, not excluding that recommended by Koklert†, and known as far back as the time of Rhases, consists, as I have already stated, in the excision of a certain portion of the skin of the affected eyelid, close to the tarsus; an operation which, when reduced to the simplicity which I shall pro-

* I am certain that those who have proposed to confine the application of the actual cautery to cases in which two or three hairs only were turned inwards towards the eyeball, have never performed it. For besides the great difficulty, after the hair has been extracted, of introducing the heated needle precisely into the foraminula from which the hair has been plucked, it is still more difficult to find the root of the extirpated hair, which may be at some distance from the point which the surgeon proposes to cauterize.

† Versuch einer neven Heilart der trichiasis. Leipzig, 1796.

pose, by excluding from it not only the apparatus of instruments formerly in use, but the employment of the bloody suture, is easily executed by the surgeon, attended with little inconvenience to the patient, and is invariably followed with immediate and certain success.

The patient being seated in a chair, if an adult, or, if a child, laid on a table of a convenient height, with the head raised, and firmly held by an assistant placed behind, the surgeon should turn out the hairs which irritate the eye with the point of a probe, then with the forceps, such as are used for anatomical purposes, or with the point of the forefinger and thumb, which answers equally well, and in many cases even better, he should raise a fold of the integuments of the affected eyelid, being particularly careful that the part taken hold of correspond exactly to the middle of the space occupied by the trichiasis; since, as I have already observed, the whole of the tarsus is sometimes turned inwards, at other times one half of it, and occasionally only a third part of it. The surgeon should raise the fold of the integuments with his left hand, more or less, according to the degree of relaxation of the integuments of the eyelid, and inversion of the tarsus, and for this evident reason, that the extent of the excision must be always proportionate to the quantity of skin raised. And that the division may fall as near to the tarsus as possible, the best method is, the thumb and forefinger resting upon the eyelid, to draw the forefinger which is towards the tarsus gently over the tip of the thumb as a fixed point, by which

the skin of the eyelid only on the side next the tarsus will be made to slide over it, so as of necessity to evert and draw out with it equally the hairs of the eyelash. If the patient be an adult, when the fold of the skin has been raised to a certain extent, he should be desired to open the eye, and if in this state the tarsus and cilia resume their natural situation, the fold of the integuments will be sufficiently elevated for the purpose. As children very seldom submit to such an experiment, we are under the necessity of doing it by guess. The forceps of Bartisch, of Verduin, and those improved by Rau, which were formerly in use, have the inconvenience of raising the integuments of the eyelid equally from one end to the other, and therefore of occasioning too much skin to be removed towards the angles of the eye, and not a sufficient quantity in the middle of it. On the contrary, by using the dissecting forceps and raising the skin precisely in the centre of the whole extent of the trichiasis, it necessarily follows that the incision made in the integuments forms an oval, the broadest part of which is exactly in the middle, or nearly so, of the eyelid, the narrowest towards the angles or commissures of it. This contributes very materially to make the cicatrix correspond to the natural fold of the eyelid, and prevents a disease contrary to that which it is intended to remedy from taking place in the angles of the eyelid, namely, an eversion of the commissures of the palpebræ.

Besides this caution relative to the situation and figure of the fold of the integuments to be removed,

particular attention, as I have said, should be paid, that the division of the skin be made sufficiently near the inverted tarsus. Without attention to this circumstance, the surgeon may be disappointed, after the healing of the wound, to find the eyelid shortened upon the whole from the eyebrow to the place of excision, but not in an equal proportion in the space between the edge of the eyelid and the cicatrix of the integuments; consequently, the tarsus will remain folded inwards as before, or not sufficiently everted to prevent the hairs from coming in contact with the eye; which inconvenience would subject the patient to a second excision of the integuments of the eyelid lower than the first.

Matters being thus arranged, the surgeon holding the fold of the integuments with his left hand, by means of the forceps, or what is better with his thumb and forefinger as I have just stated, should carefully include it in the crooked (probe) scissors* well sharpened, and being certain that one of the blades of the scissors is applied close upon the external margin of the tarsus, should remove it at one stroke. If both the eyelids, or both eyes be affected, the operation should be repeated upon each severally, without delay, with such precautions and in such proportion as the extent of the disease, and the degree of inversion of the tarsus of each eyelid may require. Afterwards, laying aside the method employed by the greater part of surgeons, of uniting the wound by sutures, it will

* Plate III. fig. 2.

be sufficient to keep the supercilium depressed, if the operation have been performed upon the upper eyelid, or if upon the lower, to support it upon the inferior arch of the orbit by pressing it from below upwards, to prevent the lips of the wound from separating; which should then be placed in perfect contact by means of strips of adhesive plaster, which ought to extend from the superior arch of the orbit to the zygoma; and for the greater security they should be maintained in that position by means of two small compresses, one applied upon the eyebrow, the other upon the zygoma, and covered with the *uniting** bandage, which should be applied in the direction of the *monoculus*.

It appears to me that surgeons have been induced to employ the suture, from observing that, after the excision of the fold of skin, of the upper eyelid for instance, the integuments were drawn so much upwards towards the supercilium, and downwards towards the tarsus, that the eyelid might be said at the moment to be denuded, and entirely deprived of skin. But this is merely so in appearance, for when the supercilium is depressed by means of small compresses and the *uniting* bandage, the eyelid is immediately covered with skin as before, and the lips of the wound are easily brought into perfect contact without the necessity of employing sutures. Gendron† is one of the few, who in these cases prefer the strips of adhesive plaster to the use of sutures, having very

* See Heister's Surgery, Part III. sect. 1. chap. ii. p. 355.

† Traité des maladies des yeux, tom. i. p. 243.

frequently observed that the use of the latter is followed by violent tension and inflammation, which cause a laceration of the parts. Of the justness of his opinion, as well as the simplicity and speediness of the operation I am satisfied from my own experience.

On removing the first dressings, the third or fourth day after the operation, the surgeon will find that the patient opens his eye without difficulty, and that the inflected tarsus and cilia have recovered their natural position and direction, thus rendering the application of the uniting bandage no longer necessary. In the partial or incomplete trichiasis, or that which occupies only one half or a third of the length of the tarsus in persons whose skins are very distensile, I have frequently had the satisfaction to find, on removing the first dressings, the wound perfectly united.

When, however, the wound has only united in part, and the remainder has suppurated and formed granulations, it should be covered with a small strip of lint spread with the ung. cerussæ. If there be fungus, it should be occasionally touched with the argentum nitratum until the cicatrix is perfectly formed. In general the cure does not exceed the fourteenth day from the operation.

Hitherto I have spoken of the radical cure of the second and most frequent species of trichiasis. As to the first form of the disease, which fortunately is very rare, in which the hairs are pointed against the ball of the eye, without the tarsus having altered its natural position, the treatment, if there be any, is exceedingly difficult, since it is demonstrat-

ed that neither the plucking out nor burning the roots of the hairs is adequate to the complete cure of the disease; and that the eversion of the tarsus, contrary to its natural direction, would equally subject the patient to the risk of a perpetual weeping of the eye, and chronic tumefaction of the internal membrane of the eyelid. Upon this point the art of surgery is yet imperfect, and the subject merits a more diligent attention, than practitioners have hitherto bestowed on it. In the case hinted at in the beginning of the chapter which came under my own observation, there only appeared two or three hairs directed against the eyeball. Having, however, bent outwards a small part of the tarsus, opposite the seat of the disease, I saw indeed that I should not succeed in replacing the two or three morbidly inclined hairs in their natural direction; but that I should be able to separate them sufficiently from the cornea, and prevent their pressing upon it without the tarsus being so much turned out as to allow the tears to fall upon the cheek. And as in this case* the skin near the tarsus was very tense, I departed from the preceding rule, by making an external incision with the back of the lancet near the tarsus three lines in extent, and removing a piece of skin of the same length, and rather more than a line in breadth. When the cicatrix was complete, the operation was as successful as the nature of the disease admitted of, but not such that this method of treatment could be said to be perfect and exempt from

* Case XIX.

inconvenience in cases of greater magnitude than the one here adduced*.

The trichiasis being cured, something remains to be done, in order to correct the disease from which it has originated, as well as to repair the injury which the ball of the eye has sustained from the friction and irritation of the inflected hairs. The indications in general are to strengthen the vessels of the conjunctiva, to diminish the enlargement of the ciliary glands, and to remove the opacity of the cornea. Of these we shall treat distinctly in the chapters on *ophthalmia* and *nebula* of the cornea.

The celebrated Albinus† is the only person, as far as I know, who has noticed the trichiasis of the caruncula lachrymalis. For the greater advantage of the student, I have thought proper to subjoin the history which he has delivered. *In subtilibus illis pilis, quos Morgagnus in caruncula lachrymali animadvertit, trichiasis speciem vidi. Unus eorum in-*

* Dr. Crampton proposes the following operation which he states to have performed in one instance, with a success which answered his warmest expectations. "Let the eyelid be well turned outwards by an assistant; let the operator then with a lancet divide the broad margin of the tarsus completely through, by two perpendicular incisions, one on each side of the inverted hair or hairs: let him then, by a transverse section of the conjunctiva of the eyelid, unite the extremities of the perpendicular incisions. The portion of cartilage contained within the incisions, can then, if inverted, with ease be restored to its original situation, and retained there by small strips of adhesive plaster, or (perhaps what is better), by a suspensorium palpebræ, adapted to the length of the portion of the tarsus which it is intended to sustain, should one or two hairs be displaced without inversion of the tarsus." Essay on the Entropion, p. 55.

† Acad. Annot. lib. iii. cap. 8.

creverat præter naturam, crassior longiorque atque ita se incurvans, ut globum oculi extrema parte attingeret. Consecuta est oculi inflammatio dira, cruciatu tetro, et quod causa non intelligebatur, pertinax. Adhibita fuerunt quæcunque suggerere ars potuerat, et empirica: collyria, epispastica, purgantia, sanguinis missiones, fonticuli, diæta. Quum nihil proficeretur, forte itum ad me. In causam si invenire possem, inquirens, ecce pilus. Quo evulso, subsedit malum. The author leaves us, however, to wish for an important elucidation; whether the hair which was plucked from the caruncle was afterwards reproduced or not, and if it were in what direction it grew.

CASE XV.

Teresa Ballerini, of Trumello, a country woman, 35 years of age, was afflicted with an obstinate chronic ophthalmia during five years, in consequence of which her sight was nearly destroyed. She was unable to raise the upper eyelid of either eye, on account of their extreme relaxed and corrugated state, and the tarsus and cilia of both eyes were seen folded inwards, and irritating the eye. A small degree of light was admitted at the internal angle of the eye, as the tarsus was less depressed and folded inwards at this part than any other. The cornea of the right eye appeared deeply opake, that of the left was only a little cloudy. The hairs had been several times plucked out by a surgeon in the country, one by one, but without advantage.

The patient being received into the practical school, and seated in a chair, I made a fold of the

integuments of the upper eyelid of the left side, with my fingers, near the margin, taking care to raise it more towards the external than the internal angle; and finding it sufficient to draw the tarsus and cilia outwards, I removed it with one stroke of the crooked scissors. I immediately brought the lips of the wound together, and retained them in contact by strips of adhesive plaster, and more especially by the application of a compress upon the supercilium and the *uniting* bandage in the direction of the *monoculus*. I immediately repeated the same operation on the upper eyelid of the right side.

On removing the first dressings, three days after the operation, the woman was able to open her eyes, and I found that the tarsi and cilia of both eyelids had recovered their natural position.

A small wound remained at the divided part on both sides, the greatest breadth of which did not exceed two lines. By the application of the unguent. cerussæ, spread upon a strip of lint, and the occasional use of the argentum nitratum, it healed in the course of twelve days. The effects of the chronic inflammation and the slight opacity of the left eye were removed in the course of a month by the use of the vitriolic collyrium, and the ophthalmic ointment of Janin; as to the right the *leucoma* was so dense as to be incurable.

CASE XVI.

Signor Count N——, of Pavia, had been subject from his infancy to a discharge from the eyes; at

the age often he was unable to raise the upper eyelid of the left eye, and in a very slight degree that of the right, or only for two or three lines towards the external angle, on which account he was obliged, for the purpose of seeing, to hold his neck sidewise and look obliquely with the right eye. The tarsus and cilia of the superior palpebra of the left eye were folded inwards, and pressed almost entirely upon the ball of the eye, and particularly upon the cornea which they violently irritated : the cartilaginous border and the cilia of the right superior eyelid, near the external angle, remained in their situation, while the rest of the hairs of the same row stimulated the cornea. On the left side the cornea was very dark, and marked here and there with small dense spots : that of the right side was merely cloudy.

The cilia were extirpated from this child five different times, and their roots touched with caustic ; but, as they always grew again more pointed and bristly than before, it was proposed to remove along with them the edges of the affected eyelids. Such were the circumstances of the case when he came under my care.

As the boy was very unmanageable, principally because he had been frequently tormented to no purpose, I was obliged to confine him more securely, by placing him upon a small bed where he could be easily held. I raised the skin of the superior palpebra of the right eye near the tarsus, by means of the forceps, making the most elevated centre or point of the wound towards the internal angle, for the reasons before assigned, and with the crooked

scissors divided it at one *stroke*; *I then repeated* the same operation upon the upper eyelid of the left side, making the most elevated point of the wound, precisely in the middle of it. The retraction of the integuments and the denudation of the eyelids had a frightful appearance to the by-standers. But by depressing the supercilium, and applying strips of adhesive plaster, with the compresses and *uniting* bandage upon each side, the integuments were made to cover the eyelids, and the lips of the two wounds were held in perfect contact. The boy took 3 ounces of emulsion with 9 drops of the tincture of opium, he slept a little afterwards, and was sufficiently quiet during the remainder of the treatment.

The dressings were removed on the fifth day, and the boy was able to open his eyes sufficiently well: the tarsi and cilia of both eyelids were now turned outwards, and so far separated from the ball of the eye as not to come in contact with it, though they could not yet be said to be in their proper and natural position. This was occasioned by the wounds having suppurated more than usual, and having a tendency to become fungous which prevented the perfect approximation of the divided edges of the skin. By repressing the fungus with the argentum nitratum, and covering it with the unguent. cerussæ, the sores healed in the course of a fortnight; and in proportion as they contracted, the tarsus and cilia of each eyelid were separated at a greater distance from the eyeball, and ultimately returned to their natural position.

By means of Janin's ophthalmic ointment, ap-

plied between the eyelids morning and evening for forty days, and the vitriolic collyrium instilled into the eye several times in the course of the day, the varicose vessels of the conjunctiva recovered their tone. The slight opacity of the cornea of the right eye was entirely dissipated; that of the left only in part, as there were many opake spots irremovable.

CASE XVII.

I undertook the treatment of an old woman who for several years had been regarded by her friends as completely blind, in consequence of an extraordinary relaxation of the upper eyelid of both eyes, produced by repeated attacks of ophthalmia, and an inversion of the edges of the eyelids. The palpebræ being forcibly separated, the tarsi and cilia of both the upper eyelids were seen pressing upon the eyeball, and the cornea of each eye had in a great measure lost its natural transparency. In making this examination, I did not perceive that on the left side there was also an inversion of a small part of the tarsus and hairs of the lower eyelid.

So great was the relaxation of the integuments of the two upper eyelids, that instead of the forceps I used the thumb and finger of my left hand, with which I raised a considerable fold of the skin near the margin of the right superior eyelid, which I divided with the scissors, removing a portion of the integuments of an oval figure, the transverse

diameter of which corresponded precisely to the middle of the palpebra, the longitudinal to its two angles. The operation was repeated in the same manner upon the left superior eyelid. I then applied upon each the usual dressings, consisting of a few strips of adhesive plaster, compresses upon the supercilium and zygoma, and the *uniting* bandage.

At the end of three days I removed the dressings for the first time, and found the whole in a good state, as the woman was able to open her eyes without difficulty, the tarsus and cilia of each eyelid had returned to their situation, and the wound, though not yet cicatrized, had a healthy appearance: I observed, however, that in the act of opening and shutting the left eye a few tears escaped from it, and that the patient complained of a little pain in it, which was not the case in the right eye. I presently discovered that towards the external angle of the lower eyelid of the left side, there was a small number of hairs, which, together with the tarsus, to the extent of two lines, was bent inwards and wounded the eye. Upon everting this part of the lower eyelid, some white indurated spots were distinctly observed, opposite the inverted portion of the tarsus, which indicated the previous existence of some small corroding ulcers, the cicatrices of which had drawn this small portion of the tarsus, together with its corresponding cilia, inwards.

I immediately divided the skin of the lower eyelid with the back of a lancet, to the extent of nearly four lines along the inverted tarsus, and having insinuated through this opening the point of a fine

pair of forceps *, I elevated and removed a small portion of the skin of an oval figure, and of a size proportioned to the degree of depression and inversion of the tarsus and hairs, and covered the wound with a strip of simple diachylon. The wound suppurated, and it was necessary to touch it frequently with the argentum nitratum. As soon as the wound was healed, that portion of the edge of the eyelid which was shortened and folded inwards recovered its natural position.

The great age of the patient, who was near 60, and the tenacity of the humor collected in the substance of both the corneæ, notwithstanding the continual use of the ophthalmic ointment, and the vitriolic collyrium for a month, did not admit of that membrane being restored, but in a small degree, to its former transparency. The patient, however, towards the end of the treatment, was able to distinguish the figures and colours of bodies, and left the hospital very well satisfied in having been freed from this painful disease.

CASE XVIII.

The daughter of Signor Giovanni R——, of Rovescalla, a child nine years of age, of a scrofulous habit, who had contracted the *scabies* while at the breast, was seized in the seventh year of her age with a chronic inflammation of the palpebræ of both eyes, especially of the right, attended with exulceration of the internal margin of the tarsus,

* Plate III. fig. 8.

and of the boundary of the sclerotic coat with the cornea in some points of it. In the course of two years the ophthalmia, especially of the right eye, resisting the use of a variety of remedies, both internal and external, which had been prescribed for it, the child gradually lost the power of opening it, except in a small degree towards the external angle. The tarsi on both sides were indurated, incrusted, and gummed, but those of the right eye were also drawn inwards, together with the cilia both in the upper and lower eyelid; the inversion in the lower, however, was confined to a small part towards its external angle. The irritation which the cilia excited in the right eye was so troublesome, that the child was incessantly carrying its hand to it.

The child was laid upon a table with her head a little raised, and firmly held by assistants, particularly by Signor Gianni, a skilful surgeon of this hospital. I formed a fold of the integuments of the upper lid of the right eye with my fingers, in such a manner as to elevate it more towards the external than internal angle, and with a pair of very sharp scissors removed a convenient portion of it, of an oval figure, close to the inverted portion of the tarsus, and in a direction parallel to it. A similar division was then made of the integuments of the lower eyelid, but of a less extent, as the inversion of the tarsus and hairs was not so considerable in this as in the upper eyelid.

The wound was wiped dry and covered in the usual manner with strips of adhesive plaster, extending from one arch of the orbit to the other;

compresses were applied upon the supercilium and zygoma, and the whole secured by the *uniting* bandage applied in the direction of the *monoculus*.

Although immediately after the operation it was impossible to keep the child in bed, in order that she might take some rest, for which purpose some drops of laudanum had been given to her, yet no bad symptom ensued. When the first dressings were removed on the third day, to the great astonishment of those around, the child opened the right eye without difficulty: the tarsus and cilia on that side had regained their natural situation, and the wound in the upper as well as the lower eyelid was perfectly healed. The great length to which the hairs that had pressed upon the eyeball were grown, contrasted with those situate towards the internal angle which had preserved their natural direction, was very remarkable.

To complete the cure, it was only necessary to cover the two cicatrices with a strip of linen spread with the unguent. cerussæ, to strengthen the varicose vessels of the conjunctiva, and to remove the opacity of the cornea of the right eye, which was obtained as far as possible, considering the great and long continued thickening which had taken place, in the space of forty days, by employing at first the Thebaïc tincture of the *London Pharmacopœia*, afterwards the ophthalmic ointment, and at intervals during the day the vitriolic collyrium.

CASE XIX.

Lorenzo Crivelli, of Montalto, a strong peasant, 26 years of age, who had never been subject to dis-

charges of the eyes, in the beginning of May, 1798, arose from bed with a pruritus of the right eye, so intolerable that he could not refrain a moment from rubbing it. This inconvenience, accompanied with heat and redness of the whole eye, increased in a few days to such a degree, that fearing he should lose his sight, he came to the hospital.

About the middle of the lower eyelid of the right side, to the extent of two lines, there was evidently an irregularity of the hairs, which grew in different directions. Three of these arose distinctly from the internal surface of the tarsus, were directed obliquely towards the ball of the eye, and pressed partly upon the lower portion of the cornea, and partly upon the conjunctiva near to it, which had an impression on it at that part, and was tinged with a spot of blood. This had taken place without the tarsus, either in that or any other part of it, having changed its natural situation.

Being sufficiently aware of the inutility of plucking out the hairs in this disease, as well as the inefficacy of the means hitherto proposed for confining them outwards by adhesive plaster, fine ligatures, and other similar measures; and observing in this case that a moderate eversion of the small portion of the tarsus to which the disease was confined, would be sufficient to separate the hairs from the eyeball without producing any remarkable deformity; I determined on this occasion, as the only means left to me, to remove a small portion of the integuments of the lower eyelid near the inverted hairs.

The patient being seated with his head bent back-

wards, and the eyelid firmly fixed by an assistant pressing upon the angles, I made an incision in the integuments with the back of a lancet, four lines in extent, immediately below the edge of the eyelid, and close to the tarsus; then having raised the divided skin with the forceps, I removed a small portion of an oval figure exactly of the same length, and about two lines and a half in its greatest breadth: the wound was covered with a strip of linen spread with digestive ointment, a compress was placed upon the zygoma, and the *uniting* bandage applied in the same manner as the *monoculus*.

On removing the dressing two days afterwards, I found the lips of the wound considerably approximated, and the edge of the eyelid proportionately drawn outwards, with the three hairs corresponding to it which had been inverted, by which the patient found himself gradually relieved from this inconvenience. One hair only, the longest of the three, pressed yet slightly upon the cornea; I say slightly, because the patient did not complain of it, and the mark of the conjunctiva was now almost entirely dissipated. The wound was touched on that day and the three following with the argentum nitratum, in order to destroy a little more of the substance of the eyelid, and to cause a still greater eversion of its edge opposite this small point of the *trichiasis*. Five days afterwards the wound was completely healed. The long hair which alone remained out of its natural direction no longer touched the cornea, but laid in the longitudinal direction of the internal edge of the lower eyelid, without occasioning any uneasiness or weeping of the eye.

I therefore believed, that I had accomplished all that the case seemed to require, and permitted the man to return home*.

* In an essay on the Entropion by Dr. Crampton, of Dublin, the author endeavours to shew, from a series of facts, that this disease, but particularly the inversion of the upper eyelid, is owing to a thickened and contracted state of the conjunctiva. As this is a subject upon which observation alone must decide, I have thought it proper to subjoin his account of the nature of the disease, and the operation which he proposes for its removal. "When the eye is voluntarily opened (says this gentleman) the upper eyelid is not drawn vertically upwards, but backwards, describing a line parallel to the anterior and superior surface of the eye, over which it moves. When the eye is completely open, the eyelid is lodged in the space contained between the roof of the orbit and the superior surface of the eye. But should this space be filled up by the thickened or contracted conjunctiva, the levator palpebræ cannot execute its functions. Every accession of inflammation contracts the conjunctiva; the conjunctiva terminates upon the margin of the eyelids; which deriving no support from without, and being constantly acted upon from within, readily yield and become permanently inverted." In order to remove this stricture formed by the conjunctiva, and to restore the parts to their natural position, Dr. Crampton recommends, that the extremities of the tarsi should be divided with a sharp-pointed bistoury introduced between the eyeball and palpebræ, and a transverse incision made in the internal membrane of the eyelid, from one angle of the tarsus to the other, and that the eyelid thus liberated should be supported in its natural position by means of a suspensorium palpebræ, till by recovering its original healthy state it is enabled to perform its functions.

CHAP. V.

OF THE RELAXATION OF THE UPPER EYELID.

THE operation detailed in the preceding chapter, is also employed for the cure of the relaxation of the upper eyelid, when it is simple or unaccompanied with a morbid inversion of the cilia towards the eyeball. This disease does not injure the organ of vision, except in as much as it prevents those who are affected with it from being able to see, without raising the upper eyelid with the finger.

The excessive elongation of the upper eyelid is sometimes, though rarely, a congenital disease: most frequently it arises from a morbid thickening of the parts, in consequence of obstinate chronic ophthalmia, in persons of a lax and unhealthy fibre, or from the long continued use of emollient and relaxing applications. It is sometimes occasioned by an atony of the elevator muscle, peculiar to this part, either simple or accompanied with a paralysis of the optic nerve, as usually happens in consequence of violent blows upon the eyeball, when the eyelids are closed, with or without laceration of the eyelid or extensive ecchymosis of the conjunctiva. It sometimes takes place during short in-

tervals, in consequence of a spasm of the orbicular muscle of the eyelids*.

The congenital elongation of the upper eyelid, and the relaxation which takes place from a morbid thickening of the parts, in consequence of the too long continued use of emollient applications, or of the eye being kept too long closed and compressed by bandages, is a disease easily characterized by the combination of circumstances which have preceded it. If the atony or complete paralysis of the elevator muscle of the eyelid have had any share in producing the relaxation of it, it may be known by making a transverse fold of the integuments with the fingers or forceps, near the superior arch of the orbit. For if this muscle have not lost its power of contraction, when it is relieved as it were from the

* The prolapsus of the upper eyelid, from paralysis of the elevator muscle, is sometimes associated also with paralysis of all or the greater part of the muscles which move the eyeball, in consequence of which, this organ becomes entirely, or in a great measure immoveable, without the optic nerve apparently participating in an equal degree in the disease. For the patient, to the surprise of the by-standers, notwithstanding the immobility of the eye, sees distinctly the objects which are presented to him. But if he is desired to raise the upper eyelid, or to move the eyeball in a particular direction, he performs it with the sound eye, firmly believing that he is doing it with both. The pupil of the affected eye is constantly dilated, even when exposed to the strongest light. I have seen several unfortunate cases of this kind, in all of which I have observed that the functions of the brain were evidently impaired, and that the disease shortly afterwards terminated in fatal apoplexy. In one instance I have observed, as a precursor of apoplexy, the sudden appearance of strabysmus and double vision.

superincumbent weight of the integuments, the patient is able to raise the eyelid and open his eye sufficiently; if otherwise, the eye remains half closed. That depression of the eyelid, with inability of raising it, which recurs at short intervals, which comes on and disappears suddenly, and which depends on a temporary spasm of the *orbicularis palpcbrarum*, is not properly a disease, but a symptom of some other general spasmodic affection, as of hypochondriasis, hysteria, chlorosis, or of diseases of the stomach, occasioned by indigestion or the presence of worms: the causes of which affections it is not difficult to ascertain.

Among the causes of this imperfection, writers on surgery have also reckoned transverse wounds of the upper eyelid or corresponding supercilium; of which however they have not treated with sufficient perspicuity. For if they intend to speak of those transverse wounds of the upper eyelid or supercilium, which destroy or violently contuse the elevator muscle, or which greatly injure the supraorbital nerve, the relaxation of the upper eyelid may certainly be the consequence, but not the only one, as they are very frequently succeeded by a much more serious accident, the total loss of sight. If they mean to include every other species of transverse wound of the upper eyelid or supercilium, it is evident that if this be unattended with loss of substance and heal by the first intention, it cannot produce a relaxation of the eyelid, and if it be accompanied with a loss of substance of the integuments or subjacent parts, and proceed to suppuration, instead

of occasioning a relaxation, when healed, it would rather produce a contrary disease, the shortening of the eyelid.

When the disease is purely local and recent, in persons not advanced in age, or affected with hemiplegia, or paralysis of the muscles of the face, and when it is derived from a morbid thickening of the parts which before were soft and flaccid: some advantage may be expected from the use of local corroborant remedies, of which cold water, with a small quantity of spirit of wine added to it, frictions upon the relaxed eyelid with the anodyne liquor, or tincture of cantharides, and the application of the soap liniment with camphor, merit a preference.

The relaxation which is symptomatic of hypochondriasis, hysteria, and of morbid stimuli in the stomach, is cured by the administration of internal antispasmodic and antihysteric remedies, by emetics and anthelminthics.

The congenital relaxation of the upper eyelid, the inveterate humoral*, and that which is accompanied with atony of the levator muscle, provided in this last case the immediate organ of vision remain sound, can only be cured by means of an operation. It is true, that in the case of atony or debility of the elevator muscle, the eye can never be so completely opened as the sound one, even after the operation; the patient, however, will be able to look at objects without being under the necessity of raising it with his finger.

* See the annexed case.

This disease is cured, as I have said, in the same manner as the trichiasis: by raising the superabundant portion of the integuments of the eyelid between the finger and thumb, and removing it by means of the scissors; observing however not to take away a greater or less quantity of skin than is necessary, that the eyelid may yield to the action of the elevator muscle, and by obeying it, may conveniently uncover the eyeball. In the most common case of trichiasis, or that which is derived from a relaxation of the eyelid, together with a morbid inversion of the tarsus and hairs, it is of the greatest importance, as I have stated, for the complete success of the operation, to make the fold of the integuments as near as possible to the inflected tarsus, that the edge of the palpebra may be gradually drawn outwards; but in the case of simple relaxation of the upper eyelid, of which I am now treating, without any morbid inclination of the edge of the palpebra or hairs, as there is no indication to be fulfilled but that of shortening the integuments of the eyelid, it is more advantageous to make the fold and excision in the proximity and direction of the superior arch of the orbit, than near the tarsus.

The excess of the integuments of the relaxed eyelid, compared with the sound one, is easily ascertained, by directing the patient to look steadfastly at an object in a line horizontal to the height of his eye; for the sound and open eye being held firmly in that position, will shew clearly

how much less the relaxed eyelid is raised than the sound one. The surgeon, therefore, having made a transverse fold of the integuments at the upper part of the relaxed eyelid, in the vicinity and direction of the superior arch of the orbit, proportionate to the disparity of its length; and the fold of skin being firmly held by means of the forceps, or by the thumb and forefinger, he should direct the patient to open his eyes. If this be performed as well on the affected as the sound side, it will be a certain indication, as I have said, of the integrity and aptitude of the elevator muscle, to contract and exert its power upon the relaxed eyelid; and if at the same time both eyelids are raised to the same height, it will be also a sufficient proof of the exact quantity of integuments comprehended in the transverse fold to be removed; in the contrary case the fold must be increased or diminished accordingly. Having done this, the surgeon should remove this fold of the integuments with one stroke of the scissors, which being more elevated in the middle of the upper part of the eyelid, than at its extremities will leave a wound of the figure of a myrtle leaf. The lips of the wound should then be placed in contact, and retained by means of strips of adhesive plaster, but especially by applying a compress upon the supercilium, and another upon the inferior margin of the orbit, and over these the *uniting* bandage in the direction of the *monoculus*. The cure is generally completed in a few days, provided, as in the case of trichiasis, the com-

presses and *uniting* bandage are exactly applied, and the latter has a proper degree of tightness given to it.

The cases which I have related in the preceding chapter on trichiasis, render it unnecessary for me to adduce more than one instance in support of this operation, although I could have introduced several. To the young surgeon, however, it will be useful to read upon this subject the case published by Morand, in the second volume of his *Opuscules de Chirurgie.*

CASE XX.

Major F—— in the service of his imperial majesty, 40 years of age, of a robust constitution, exposed to the hardships inseparable from war, was attacked with violent inflammation in both eyes, and severe pain in his head and all his limbs.

He was bled, and repeatedly purged; sudorifics were employed, and locally emollient applications. After some weeks the redness of the right eye was dispersed, but not that of the left. The patient still continued the emollient and relaxing applications for a long time; in consequence of which, the conjunctiva was not only tumid and filled as if with reddish serum, but the upper eyelid also, from the continual determination to it, became swollen and edematose, and fell upon the eyeball, the patient losing the power of raising it, and consequently of opening the eye. During a year and a half, both in Germany and France, Major F—— tried vari-

ous external and internal remedies, not excepting mercurials, without any material advantage. And to add to his misfortune, was obliged, during this time, to have the left eye covered with a compress and bandage, which also contributed to elongate and depress the eyelid still more, and render its voluntary action more difficult.

In 1814 this gentleman came to consult me on his disorder. I found the eyeball sound and moveable in all directions, and the vision perfect. I made a fold of the integuments of the eyelid with my fingers, and the patient immediately opened the eye without difficulty. The height of this fold was the exact measure of the quantity of integuments of the eyelid which it was necessary to remove in order to obtain a cure. The operation was performed in the manner detailed in the preceding chapter, and the patient in a short time found himself free from his long and troublesome complaint. The varicose state of the vessels of the conjunctiva, as well as thickening of the Meibomian glands and tarsi, consequent on the previous irritation occasioned by the prolapsus of the eyelid, disappeared at the same time.

CHAP. VI.

OF THE EVERSION OF THE EYELIDS.

As the excessive relaxation of the integuments of the palpebræ, and the morbid abbreviation of their internal membrane near the edge of the eyelid, in consequence of small corroding ulcers, and the cicatrices consequent on them, occasion a morbid inclination of the tarsus and cilia towards the eyeball; so, occasionally, the too great relaxation and tumefaction of their internal membrane, or the too great contraction and shortening of the skin of the eyelids, or of the integuments of the surrounding parts, produce a disease contrary to that of trichiasis; the turning outwards or eversion of the eyelids, termed *ectropion.*

With regard to the causes, therefore, there are two distinct species of this disease; the one arising from a preternatural tumefaction of the palpebra, which not only separates its edge from the eyeball, but also presses upon it in such a degree as ultimately to evert it; the other produced by a shortening of the skin covering the eyelid, or that of the neighbouring parts, by which the ciliary edge is, in the first instance, separated from the ball of the eye, and afterwards gradually turned outwards, together with the whole of the eyelid.

The morbid tumefaction of the internal membrane of the palpebræ, which occasions the first

species of eversion, not considering at present that of a similar kind, which takes place in old age, is generally derived from a congenital laxity of the conjunctiva, increased by attacks of obstinate chronic ophthalmia, especially of the scrofulous kind, in persons of a weak and unhealthy fibre; or is the consequence of a variolous metastasis to the eyes, accompanied with a relaxation of the vessels of the conjunctiva; of the crusta lactea, impetigo, or other eruptive diseases of the skin imprudently repelled.

While the disease occupies the lower eyelid only, which is most frequently the case, its internal membrane is elevated in the form of a semilunar fold, of a pale red colour, resembling the fungous flesh of wounds, interposed between the ball of the eye and the lid, which it everts to a certain extent. But when the morbid tumefaction has extended to both the eyelids, the disease presents a circular appearance, in the centre of which the eyeball lies as if imbedded, while the circumference presses upon, and turns out the edges of both the eyelids, occasioning considerable uneasiness and deformity. In either case, if the integuments of the eyelids are compressed with the point of the finger, it is evident that they readily admit of being elongated, and that the eyelids would yield so as to cover the eyeball completely, if they were not prevented by this intermediate tumefaction of their internal membrane.

Besides the great deformity which this disease occasions, it produces a continual discharge of tears upon the cheek, aridity of the ball of the

eye, frequent attacks of chronic ophthalmia, intolerance of light, and in the end nebulæ and ulceration of the cornea.

The second species of eversion, or that occasioned by a shortening of the skin which covers the eyelid or surrounding parts, is not unfrequently a consequence of contractions produced by the confluent small-pox in the integuments of the face near the eyelids, or in those of the eyelids themselves; of deep burns accidentally inflicted on them; of the extirpation of cancerous warts or encysted tumors of the eyelids or circumjacent parts, where a sufficient quantity of skin has not been saved; of the malignant carbuncle; and lastly, of lacerations of those parts, attended with considerable loss of substance. Each of these causes is sufficient to produce such a contraction and shortening of the integuments of the eyelids, as to draw them towards either of the arches of the orbit; and consequently to separate them from the eyeball, and cause an eversion of their edges. This effect no sooner takes place than it is succeeded by another no less inconvenient, the tumefaction of the internal membrane of the eyelid, which also greatly contributes to complete the eversion. For the internal membrane of the eyelid, though slightly everted, being incessantly exposed to the contact of the air, and continually irritated by extraneous substances, in a short time swells, and is elevated in the form of a fungus; a part of which by degrees covers a portion of the eyeball, the other presses the eyelid outwards, and produces so

considerable an eversion of it, that its edge is not unfrequently brought in contact with the margin of the orbit. This second species of the disease is attended with the same unpleasant effects as the first, to which it may be added, that when either form of the disease has been of long standing, the fungous tumefaction of the internal membrane of the eyelids becomes indurated, coriaceous, and almost callous.

Although the internal membrane of the eyelid, in both these species of eversion, appears equally tumefied, yet the surgeon may easily determine to which of the two species the disease belongs. For, in the first form of the disease, as I have stated, the skin of the eyelid, or surrounding parts, is not disfigured with scars, and the everted eyelid, on being pressed upon with the point of the finger, would rise again without difficulty, so as to cover the eye completely, if this carnous substance were not interposed; while, in the second species of eversion, besides the evident scars and contractions which are seen upon the skin of the eyelid or neighbouring parts, if an attempt be made to restore the eyelid to its situation, it either does not yield so as to cover the eyeball entirely, or it can only be reduced to a certain extent; or from the edge of the eyelid having contracted an adhesion to the arch of the orbit, in consequence of a very considerable destruction of the integuments, it does not admit of being removed in any degree from its unnatural position.

From comparing therefore these two species of eversion, it must be evident that a perfect

cure of this disease cannot be effected equally in both forms of it, and that the latter species in some instances is absolutely incurable. For as the treatment of the first species of eversion, which depends only on a morbid tumefaction of the internal membrane of the palpebræ, merely consists in removing that which is superfluous, the art of surgery possesses many efficacious means perfectly adequate to the fulfilment of this indication. But in the second species of the disease, in which the principal cause consists in the loss of a portion of the skin of the eyelid or surrounding parts, which no artifice hitherto known can restore, a complete cure of the disease cannot be obtained. The surgeon must be therefore content to remedy, as far as possible, the evils attendant on it, and that in a more or less satisfactory manner, according to the greater or less destruction of the integuments; and to abandon as incurable those cases in which the edge of the eyelid is found to be united to the arch of the orbit. *Si nimium palpebræ deest*, says Celsus*, *nulla id restituere curatio potest.* In the treatment then of the second species of eversion, the degree of success must be determined in every case by the surgeon's observing to what extent the eyelid can be reduced by gently pressing it towards the eyeball with the point of the finger, both before and after the employment of such means as are calculated to produce an elongation of its integuments, since it is to this point only that it can be reduced and maintained in its position permanently.

* Book VII. chap. 7.

With respect to the treatment of the first species of eversion, if the disease be recent, the fungous state of the internal membrane not considerable, and consequently the eversion of the edge of the eyelid small, of two lines in extent or little more, and in young persons, (for in those advanced in years the eyelids are so flaccid that the disease is altogether incurable*), it may be removed by

* I was under a misapprehension, when, in my letter to Professor Mannoir, I expressed my dissent to the operation proposed by Sir W. Adams for the cure of the Ectropion. From the extract of his work it appeared to me that he designed to give a general rule for the treatment of the disease; but on perusing it afterwards, I found that his new operative process was confined to the somewhat rare case, in which, from the inveteracy of the disease, the extraordinary relaxation of the eyelid, and elongation of the tarsus, particularly in subjects advanced in years, the simple excision alone of the fungus interposed between the eyeball and everted palpebra, is insufficient to effect a perfect cure of the disorder; which, according to the author, is to be completely obtained by removing, together with the fungous excrescence, a portion also of the everted eyelid, and consequently of the preternaturally elongated tarsus; and that in the following manner. The affected eyelid is divided with the scissors by a double incision, in the form of the letter V, as in the operation for the cure of the hare-lip; the fungus projecting from the internal membrane of the eyelid then being removed, the wound is united by a suture and strips of adhesive plaster, extending from the nose to the ear. On the fifth day the suture is removed, and the strips of plaster continued until the wound is perfectly healed.

The author observes, that the obstacles which may prevent the success of this operation, are, in the first place, the too large an excision of the parts by which they become so much stretched by the ligature, as to produce ulceration before an union is effected; secondly, that the wound, suppose of the lower eyelid, may not completely reunite either at its lower angle, occasioning the tears to fall upon the cheek; or at the upper part near the tarsus. Indeed, of four patients operated on by the author, in the second and third, on removing the dressings, the tarsus had not united;

destroying the superficial fungus of the internal membrane of the eyelid with the argentum nitratum, which ought to be executed in the following manner. The surgeon should completely evert the affected eyelid with his left hand, and with his right wipe it dry by means of a piece of linen cloth; he should then rub the caustic strongly upon the whole extent of the superficial fungus, so as to produce an eschar. In order that it may occasion the patient as little pain as possible, at the moment the caustic is withdrawn an assistant should instantly cover the cauterized part with a little oil, which will prevent the tears from readily

and in the fourth case, a reunion had not taken place at its lower angle, which threatened to become fistulous. Nor can it be surprising, that the first, especially, of these two accidents, should happen frequently, on account of the cartilaginous substance of the tarsus not uniting so readily as the rest of the muscular and tegumental texture of the eyelid. These difficulties, as far as we are assured by the author, are overcome by determining with scrupulous attention the quantity of substance of the eyelid to be removed in proportion to its relaxation, and the elongation of the tarsus; and also by making the suture not immediately below the tarsus, but in the middle of the incised parts, and after its removal, by persisting in the diligent application of the strips of adhesive plaster, occasionally touching the lips of the wound with the argentum nitratum, in order to dispose it the better to granulate and close.

This fact authorizes us to affirm, that even the ectropion, from excessive relaxation of the eyelid, and extraordinary elongation of the tarsus, is susceptible of perfect cure; and that, of the three forms, therefore, under which this deformity appears, that alone is strictly incurable in which the loss of the common integuments from which the eversion has originated, has been so considerable, that even after the fungus interposed between the eye and everted palpebra has been removed, it is beyond the power of the art to elongate it so as to make it cover the eye.

dissolving the argentum nitratum, and diffusing it over the eyeball. If, however, any portion of the dissolved caustic should occasion uneasiness, it ought to be washed off, by frequently dropping into the eye a little new milk. This application of the caustic should be repeated for several successive days, until it has produced a sufficient ulceration and destruction of the superficial fungus of the conjunctiva, especially near the tarsus; after which lotions of simple water, or barley water with mel rosæ, will be sufficient to promote the suppuration and cicatrization of the wound. The result of this treatment will be, that in proportion as the internal surface of the eyelid heals, the eversion will gradually diminish, and the edge of the eyelid finally regain its natural position*.

This method of treatment, as I have just stated, is only practicable with perfect success in cases of recent and very slight eversion. Where the disease is considerable and of long standing, the most expeditious and certain method of remedying it, is that of extirpating the whole fungus, close to the internal muscular substance of

* I have found the application of the *kali purum* not only preferable to the argentum nitratum, but in some respects to the excision of the part by the knife. Practitioners appear to have been deterred from using it in these cases, by an apprehension of its action not being easily confined to the diseased part, an objection altogether unfounded. With the precautions laid down in the text, and by frequently wiping off the moisture produced on the cauterized part, it may be employed with the utmost nicety. It is less revolting, and, I think, less painful, to the patient than the latter, and does not require to be repeated so often as the milder caustics.—TRANS.

the eyelid. The patient being therefore seated, and his head bent somewhat backwards, the surgeon should hold the everted eyelid firmly with the point of the fore and middle finger of his left hand, and with the curved scissors* in his right, should include the excrescence of the internal membrane of the palpebra, as near to its base as possible, and remove it completely; the same operation should then be repeated on the other eyelid, when both are affected; and if the excrescence be of such a figure that it cannot be exactly included between the scissors, it should be raised as much as possible with the forceps, or a double-pointed hook, and divided at its base by means of a small convex-edged bistoury†. The hæmorrhage, which at the commencement of the operation is considerable, either ceases spontaneously or may be checked by washing the eye with cold water. The dressing should consist of two compresses, one placed upon the superior, the other upon the inferior arch of the orbit, and over these the uniting bandage in the form of the *monoculus*, or applied in such a manner as to press upon and replace the edge of the eyelid, so that it may cover the eyeball again. When the first dressings are removed, which ought to be 24 or 30 hours after the operation, the eyelid will be found to have recovered entirely, or nearly so, its natural position. The dressing should afterwards consist in washing the sore twice a day, either with simple water, with the aqua malvæ, or

* Plate III. fig. 3 and 4. † Plate III. fig. 12.

with barley water and mel rosæ, until it is completely healed. If towards the end of this period the wound assume a fungous appearance, or if the surgeon perceive that the eyelid is yet too far separated from the eyeball, it should be frequently touched with the argentum nitratum, in order to destroy a little more of the internal membrane of the eyelid, so that when the cicatrization is completed, the contraction may be such as to draw the edge of the palpebra nearer to the ball of the eye. In the mean time, proper measures should be employed to remove the causes by which the eversion has been produced; as the chronic ophthalmia, the morbid determination of humors to the eye, and the weakness and varicose state of the vessels of the conjunctiva, of which I shall have occasion to speak in the chapter on ophthalmia.

The indication of cure in the second species of eversion, or that which is produced by an accidental shortening of the integuments of the eyelids or of the surrounding parts, is not different from that already mentioned. If the shortening of the integuments has been capable of everting the eyelid, the extirpation of a portion of its internal membrane, and the cicatrix which must ensue from it, may, for the same reasons, restore the eyelid to its former position*. But since that portion of the integuments which is lost can never

* See the valuable papers on this subject by Messrs. Bordenave and Louis, the former of whom appears to be the first who adopted this operation as a general mode of treatment. Memoires de l'Acad. de Chirurg. Vol. V. p. 97. Vol. I. p. 440.—Trans.

be reproduced, and in whatever degree the whole eyelid is shortened, so it must always remain, even after the most successful operation; consequently the treatment of the second species of eversion can never succeed so perfectly as that of the first species, and the eyelid, though replaced, will always remain shorter than natural, in a degree proportionate to the greater or smaller quantity of integuments lost. In a considerable number of cases, indeed, the eversion appears greater than it is in reality, with regard to the small quantity of skin which is destroyed; for, when the disease has once taken place, however small the contraction of the integuments may be, the tumefaction of the internal membrane gradually increases, so as to produce a complete eversion of the eyelid. The operation in these cases is attended with a degree of success which could not have been expected by those unacquainted with the nature of the subject; for after the fungus of the internal membrane of the diseased eyelid has been extirpated, and its edge brought towards the ball of the eye, the shortening of the eyelid which remains is so inconsiderable, that in comparison with the deformity and inconvenience which it occasioned in its former state, the cure may be considered as perfect; of this we have an example in the annexed figure*. Whenever therefore the retraction of the integuments of the everted eyelid, and consequent shortness of it is not so considerable as to prevent it from rising again and

* Plate II. fig. 1, 2.

covering the eye, if not perfectly, at least in a tolerable degree, the surgeon should undertake the operation in the manner already explained, employing, according to circumstances, sometimes the curved scissors, at other times the convex-edged bistoury, or both. When the disease has existed for a considerable time, and the internal membrane has become hard and almost callous, the everted eyelid should be covered with a soft poultice of bread and milk for some days previous to the operation, in order to render it flexible and more easily separable than in its former rigid state.

It is one of the most certain and demonstrable facts, that the division of the cicatrices of the integuments, which have given rise to the contraction and eversion of the eyelid, does not produce a permanent elongation of it, and therefore is attended with no advantage in the treatment of this disease. We see the same thing happen after deep and extensive burns of the skin of the palm of the hand and fingers, in consequence of which, whatever diligence be employed during the treatment to keep the hand and fingers in an extended state, as soon as the cicatrix is complete, the fingers are found irremediably bent. The same thing takes place after extensive burns of the face and neck. Fabricius ab Aquapendente*, who was well aware of the inutility of the semilunar division of the integuments of the eyelids, in order to remedy their shortening and eversion, proposes, as the

* De Chirurg. Operat. cap. xv.

best expedient, that of stretching them by means of adhesive plasters applied upon the eyelid and supercilium, and tied firmly together. Experience has taught me that whatever advantage may be derived from this practice, is equally obtained by the application of a bread and milk poultice for several days, afterwards of oily embrocations, and lastly of the *uniting* bandage, so applied as to extend the shortened eyelid in a direction contrary to that produced by the cicatrix: which practice ought to be diligently employed in every case previously to the operation being undertaken.

When the operation is determined upon, the patient, if an adult, being seated in a chair, or if a child, laid upon a table with the head a little raised, and held by proper assistants, the surgeon should make an incision with a convex-edged bistoury, of a sufficient depth in the internal membrane of the eyelid along the tarsus, carefully avoiding the *puncta lachrymalia*, then elevating the edge of the divided membrane with the forceps, should continue to separate it with the knife from the whole of the internal surface of the eyelid, in the manner usually employed in the anatomical dissection of it, until the separation be completed, as far as the point where this membrane is about to leave the eyelid, to reach the anterior hemisphere of the eyeball, receiving the name of conjunctiva. The separation being carried to this point, the surgeon, raising the membrane with the forceps still higher, should entirely remove it by one or two strokes of the scissors close to the deepest part of the eyelid. The dress-

ing should consist as usual in the application of a compress and the *uniting* bandage, in order to facilitate the return of the everted eyelid towards the ball of the eye. On changing the dressings, one or two days after the operation, the eyelid will be found in a great degree reinstated, and the deformity which it occasioned considerably lessened.

It is seldom that the operation is followed by any unpleasant symptoms, as vomiting, great pain, or violent inflammation. If, however, they should take place, the vomiting may be relieved by means of an opiate clyster, and the pain and inflammation with great tumefaction of the eyelid lessened by the application of a poultice, or bags of emollient herbs, employing at the same time internal antiphlogistic remedies, until these symptoms have entirely subsided, and suppuration has commenced upon the internal surface of the eyelid. When the suppuration has taken place, the part should be washed twice a day with barley water and mel rosæ, and the wound touched occasionally with the argentum nitratum, in order to keep the granulations within certain bounds, and to promote a solid cicatrix capable of retaining the reduced eyelid in its situation.

CASE XXI.

A young woman, 20 years of age, of a delicate constitution, and of a lax and chlorotic fibre, after an obstinate ophthalmia, had both the lower eyelids turned outwards to the extent of about two

lines. The disease, besides disfiguring the patient's countenance, occasioned a discharge of tears and matter upon the cheek. The everted edge of both eyelids had a florid appearance, and was a little elevated and fungous.

After having tried the use of astringent collyria for a week, without advantage, I formed the resolution of destroying deeply the internal margin of both eyelids by means of caustic. For this purpose having separated the eyelids one after the other from the eyeball, and carefully wiped them, I applied the argentum nitratum upon the superficial fungus of their internal margin, and pressed it upon it so firmly as to produce an eschar, which was immediately covered with a layer of oil, and the patient's eyes afterwards bathed with new milk. This application of the caustic was repeated six times at different intervals, and always with evident advantage; so that in twenty-six days I had the satisfaction of seeing the edges of both eyelids raised to their situation. The collyrium vitriolicum was employed for a considerable time after the cure, in order to prevent a return of the disease.

CASE XXII.

Giuseppa Mileri, a girl 9 years of age, a native of Pavia, of an unhealthy constitution, incautiously ran the point of a knife across the cornea of the right eye. This accident left a deformed cicatrix, and occasioned a chronic ophthalmia, which by degrees degenerated into an enormous swelling of the internal membrane of the lower

eyelid, producing an eversion of it, and giving the child's *countenance* a disgusting appearance. At the time of her admission into the school of clinical surgery, which was some months after the appearance of the ectropion, the child complained of no pain when the part was touched with the point of the finger.

I proceeded to remove the fungus with the curved scissors, and covered the part with a piece of linen spread with an ointment consisting of wax and oil, over which I applied a compress and the *uniting* bandage. When the dressings were removed, four days afterwards, the eyelid had already risen up considerably, and on the following day the suppuration was completely established. The eyelid remained nearly stationary for a week. As soon, however, as the wound began to heal, and consequently to contract, the eyelid rose up in an equal degree, and when the cicatrix was complete it recovered its natural position.

During the whole of the treatment, which took up about a month, no other external remedy was employed than a lotion of barley water and honey of roses, with some applications of the argentum nitratum, when the granulations were too prominent; an electuary, consisting of cinchona and the antimonial æthiops, was afterwards employed with advantage. When the wound was completely healed, I directed the ophthalmic ointment of Janin to be used morning and evening for some weeks, in order to strengthen the varicose vessels of the conjunctiva, which was attended with the best success. The extensive scar upon the cornea had

entirely deprived the child of the sight of the eye, but the ectropion was completely cured.

CASE XXIII.

A countryman, 38 years of age, was attacked with an erysipelas of the face, in consequence of which the eyelid and supercilium of the left side were greatly swollen, and the inflammation terminated in suppuration. The matter discharged itself by bursting at three distinct places in the upper eyelid, near the superciliary arch. The surgeon, in order to expedite the healing of the ulcers, determined to divide and remove by the knife the apertures from which the matter was discharged; and whether in this operation he had extirpated a portion of the integuments of the eyelid, or they had been too much destroyed by the ulceration, in proportion as the ulcer healed, the eyelid was observed to be more and more drawn upwards and everted, until it no longer covered the eyeball. In consequence of which the internal membrane of the palpebra, from being long exposed to the air, became greatly tumefied and by degrees degenerated into a fungous substance. In order to remedy this inconvenience in the best possible manner, I made the patient sit in the same position as in the operation for the cataract, and with a small convex-edged scalpel I began to separate the internal fungous membrane, commencing the incision near the external, and continuing to divide it nearly as far as the internal angle of the eye, taking care to avoid the part occupied by the *punctum lachrymale.*

Having done this, I took hold of the membrane with the forceps, and then, continuing the incision, I separated it from the whole internal surface of the eyelid, as far as where this membrane is about to reach the anterior hemisphere of the eyeball, and form the conjunctiva.

As soon as the membrane was separated, the eyelid fell upon the ball of the eye, and almost entirely recovered its former appearance. The loss of blood was inconsiderable; but a little after the operation the patient was seized with a violent vomiting, which continued for two hours, and was checked by administering opium freely by the mouth and by clyster.

For a few days the eyelid was moderately swollen, but subsided on the commencement of the suppuration on its internal surface, and in 14 days from the operation the patient was completely well, as far as the nature of the case admitted.

The eye was not disfigured, although the eyelid in reality was a little shorter than the right. He could raise it and depress it at pleasure, and apply it to the eyeball. When he wished to close his left eye entirely, the lower eyelid was carried upwards beyond its usual limits, and thus supplied the defect of length in the upper.

CASE XXIV.

A boy, 10 years of age, in the beginning of October 1790, having lain during the night in a sheet upon which ears of corn had been thrashed, awoke in the morning with the eyelids of his left

eye swollen and painful. Notwithstanding the use of emollient topics, an abscess formed in the upper eyelid, which burst below the supercilium towards the temples, and left an opening which could not be healed by any methods of treatment which were employed. In process of time the upper eyelid began to be turned outwards, and its internal membrane to swell and protrude, and to increase the eversion of it prodigiously.

Towards the middle of June 1791, about eight months from the first appearance of any disease, the fungous excrescence formed by the internal membrane of the eyelid, covered a considerable part of the upper hemisphere of the eyeball, and the eversion was so considerable that the margin of the lid, especially towards the temples, was almost close to the eyebrow. The eyelid, however, readily yielded on being pressed upon with the point of the finger, and appeared as if it would have descended and covered the eye had it not been for the intervention of this fungous substance formed by its internal membrane.

As the fungus was dry and indurated, I ordered that a bread and milk poultice should be applied upon it for 24 hours; I then removed the whole of it with the curved scissors at one stroke, carefully avoiding the superior lachrymal punctum.

After the extirpation it was discovered that there was a piece of wheaten straw almost an inch long and half a line thick, contained in the fold of the fungus. The whole of the superfluous part of the internal membrane being now removed, the eyelid descended over the eye so as to cover it conveni-

ently. The operation was not followed by any unpleasant symptom, and 10 days afterwards the child left the hospital, so far cured that no defect remained, except a small elevation of the eyelid near the external opening where the abscess had burst.

As there can be no doubt that the piece of straw had prevented the ulcer of the eyelid from healing, during eight months after the bursting of the abscess, it is singular how such an extraneous body could have been forced through the internal membrane of the eyelid, without the child having been awaked by it.

CASE XXV.

Giuseppe Antonia Scanarotti, aged 36 years, living in the vicinity of Stradella, had a wart for a considerable time near the inferior orbital arch of the right side, which in January, 1795, began to be painful. A surgeon in that neighbourhood applied a cerate upon it, the effect of which was, that two days afterwards he was seized with an erysipelas, which extended over the whole of the right side of the face. The surgeon then altered his plan, and as soon as the erysipelas began to disappear, he applied the actual cautery upon the tubercle, and destroyed it deeply, covering the eschar with a poultice of bread and milk, which was continued for several days. On the loosening of the eschar the part was found in the state of a simple wound, and healed in the course of two months*. In conse-

* Plate II. fig. 1.

quence of this cicatrix, the lower eyelid was drawn a little downwards and outwards. In process of time the internal membrane of the eyelid began to be elevated, and to assume a fungous appearance, and in about two years from the time of the accident, the fungus became so exuberant as to evert the whole of the eyelid in the manner represented in the 1st figure of the 2d plate. The great deformity of the countenance, and the perpetual weeping of the eye which the disease occasioned, induced the patient to come into the hospital the 29th of December, 1797*.

On pressing the lower eyelid upwards with the point of the finger, I found that the skin yielded sufficiently to allow of its being nearly restored to its natural position, and was therefore induced to hope, that this poor man's condition might be ameliorated. And as the fungus of the everted eyelid was hard and coriaceous, I covered it for three days with an ointment consisting of oil and wax spread upon linen, over which was applied a poultice of bread and milk.

On the 3d of January, 1798, the patient being placed in a chair, with the small convex-edged bistoury, I made an incision along the internal margin of the tarsus of the lower eyelid, from one canthus to the other, avoiding the *punctum lachrymale*; and by continuing to separate the internal membrane downwards, I removed along with it the

* This case is recorded in the 1st vol. 4th part, p. 806, of a journal translated from the German, by Thomas Volpi, entitled, Biblioteca della più recente letteratura medico-chirurgicha.—Fr. Edit.

whole of the fungus. After having covered the part with a piece of linen spread with oil and wax, I applied a very high compress upon the zygoma and eyelid, and over it the *uniting* bandage in the direction of the *monoculus*.

On the 6th, the dressing was removed for the first time, and the eyelid was found to have advanced more than two-thirds towards its natural position. I washed the parts with the aqua malvæ made tepid, and renewed the dressing as at first.

On the 9th, the eyelid had risen up towards the eyeball more than on the preceding days. The granulations being too luxuriant, were touched with the argentum nitratum, and the eschar was immediately smeared with oil.

On the 10th, 11th, and 12th, nothing particularly occurred, except that the cicatrix began to be formed near the internal margin of the tarsus.

On the 13th, 14th, and 15th, it was necessary to touch the ulcer towards the internal angle of the eye with the argentum nitratum.

On the 21st, the wound was completely healed, by employing a wash, consisting of the aqua calcis and mel rosæ, three times a day. The eyelid had gained the highest degree of elevation it was capable of attaining, and precisely as it is seen in the 2d figure of the 2d plate. The difference, though very inconsiderable, which is also observable in the figure, was proportionate to the loss of integuments before sustained in the part where the cicatrix was formed, a loss not reparable by any ingenuity hitherto devised. By this operation, however, the deformity and weeping of the eye were removed.

CASE XXVI.

Maria Teresa Zeccone, of Marcignago, was afflicted at the age of 6 years with a malignant carbuncle on the inferior and somewhat lateral external part of the lower eyelid of the right side, which produced a considerable destruction of the integuments. The deformed and tense cicatrix which succeeded it, occasioned afterwards an enormous eversion of the eyelid. I examined this girl's eye when she had attained the sixteenth year of her age. The everted portion was at least five lines in breadth; the tears were incessantly discharged over the cheek. The eyelid could be pushed upwards only in a very small degree, in consequence of the contraction of the integuments, especially towards the external angle of the eye. The great deficiency of integuments, and the rigidity of the cicatrix, did not permit me to hope for a perfect cure; however, I was desirous of alleviating her condition, and a bed was therefore allotted to her in the hospital, on the 17th of December, 1799. In order to render the integuments of the eyelid and the cicatrix as flexible as possible, I directed that the part should be anointed several times with lard, and that the *uniting* bandage should be applied in such a manner as might tend to elongate the skin of the cheek and affected eyelid from below upwards; which was employed until the 22d day of the same month with great advantage.

The following day I performed the operation, by making an incision with the convex-edged bis-

toury upon the internal fungous membrane of the everted eyelid, close to the tarsus, from the external towards the internal angle, avoiding the inferior *punctum lachrymale*; and having separated it in a great measure, and detached it as far as where it begins to receive the name of conjunctiva, I raised it with the forceps, and completely removed it by a single stroke of the curved scissors. I desired the patient to close her eye as much as possible, and having covered the part with a dossil of dry lint, to repress the bleeding, I applied the *uniting* bandage upon the eyelid. The dressing was removed two days afterwards, and the eyelid found straightened and considerably elevated towards the eyeball. The wound was washed with warm water, and covered with a piece of linen spread with the ointment, consisting of oil and wax, and the *uniting* bandage re-applied, so as to press the integuments of the eyelid still more upwards.

On the 27th the suppuration was very copious, and the wound had a tendency to become fungous. On the 29th this fungus had increased, so as evidently to oppose the farther elevation of the eyelid, I therefore removed it at once with the curved scissors.

On the 1st of January, 1800, the suppuration was again abundant. The wound was washed several times a day with barley water and mel rosæ. On the 5th I ordered the ophthalmic ointment of Janin to be applied upon the internal surface of the eyelid at bed-time, in order to repress the tendency which the wound always had to the formation of fungus. This application was continued until the 10th.

At this period the eyelid had almost attained the greatest degree of elevation of which it was capable, and embraced the lower hemisphere of the eyeball, so that the tears were no longer discharged over the cheek.

From the 10th to the 20th the wound was occasionally touched with the argentum nitratum, and washed with barley-water and honey; by means of which it was perfectly healed.

On the 22d the girl left the hospital very well satisfied with her improved appearance. For no other defect remained than that depending on the shortness of the lower eyelid, which, however, was not very evident, unless when she looked upwards.

L

CHAP. VII.

OF THE OPHTHALMIA.

There are two species of ophthalmia: the one acute and truly inflammatory, arising from an excess of stimulus and reaction of the living solid: the other chronic, from debility, and most frequently confined to the vessels of the eye, or those of the eyelids, but which occasionally is connected with a weakness of the general constitution at the same time. The Arabian physicians have not improperly denominated the one ophthalmia *calida*, the other *frigida*.

This distinction, founded on observation and experience, is the most certain guide which we have in the treatment of the ophthalmia. For the first species of this disease invariably requires the use of general antiphlogistic remedies, and mild emollient applications; the other that of astringent and corroborant remedies, either alone or conjoined with the internal administration of tonics, in order to strengthen the patient's general constitution.

Besides this distinction, it is in my opinion of the greatest importance, in the treatment of this disease, to know that the *acute* ophthalmia, which is really inflammatory, even when treated in the most effectual manner, is scarcely ever so completely resolved, that a certain period having elapsed, and

the inflammation entirely ceased, some small degree of *chronic* ophthalmia does not remain in the conjunctiva and surrounding parts from local debility. This takes place either in consequence of the distension of the vessels of the eye, during the period of inflammation, or of the increased morbid sensibility of the whole organ of vision; which morbid sensibility continuing in the eye, after the *acute* inflammatory ophthalmia has ceased, keeps up a determination of blood to that organ, and the parts surrounding it, which may readily lead the inexperienced to believe that the inflammation is not subdued.

Of the great importance of this observation, in determining with precision, at the bed-side of the patient, not only the species, but also the different stages of the disease, and consequently the selection of remedies best adapted to each of them, I have been repeatedly convinced, from the result of my own practice and that of others. For I have frequently remarked, that those surgeons, who, whether guided by these principles or by an extensive experience only, know how to avail themselves of the precise moment in which the *acute* ophthalmia changes into the *chronic* from local debility, speedily conduct the disease to a termination by substituting astringent and corroborant, for emollient and relaxing applications; while others, who either from ignorance or inattention are deceived by the appearances, continue the use of emollient and mild remedies, and thus perpetuate the turgescency of the vessels and the redness of the con-

junctiva, under a supposition of the inflammation still continuing in it as at first. It is precisely on this account that every empiric can boast of having cured obstinate cases of ophthalmia with his *aqua mirabilis*, while he imposes upon the public in vending it as a specific for ophthalmia in general; since this collyrium, which quickly dissipates the disease in the second stage, greatly aggravates it in the first. On this subject, says Hoffman*; *ausim dicere, plures visu privari ex imperitia applicandi topica, quam ex ipsa morbi vi ac magnitudine*; which is particularly applicable to the ophthalmia.

In order to place these general principles relative to the ophthalmia in the clearest light, and to render them intelligible to the young surgeon, I have thought it necessary to enter into a minute detail of the phænomena of this otherwise frequent and well known disease.

The *acute* inflammatory ophthalmia is either mild or violent; both are accompanied with the same symptoms which characterize the inflammation of other parts, with the addition, however, of a series of other ill effects depending upon the disturbed function of the organ of vision.

In the mild *acute* ophthalmia, the internal surface of the palpebræ and the white of the eye become unusually red, the patient feels a sense of heat in the eyes greater than natural, accompanied with heaviness, pruritus, and pricking, as if small particles of sand had accidentally got into them.

* Dissertat. de erroribus vulgaribus circa usum topicorum in praxi, § 7.

In that part of the eyeball where the sensation of pricking is most complained of, a small fasciculus of blood-vessels is constantly met with upon the conjunctiva, more elevated and turgid than the rest of the small vessels of the same order. The patient voluntarily keeps his eyelids half closed, on account of the stiffness and difficulty which he finds in opening them, and because by this means he moderates the impulse of the light, to which he cannot expose himself, in any considerable degree, without feeling the sense of heat, the pricking, and discharge of tears increased. If the patient possess much sensibility, his pulse becomes a little quick, especially towards the evening, or he is affected with lassitude, dryness of the skin, slight shiverings, and in some cases with nausea and inclination to vomit.

The disease is frequently of a catarrhal character, or what is commonly called a cold in the head, attended with a defluxion, in which the eyes as well as the frontal sinuses are affected, and sometimes also the fauces and trachea. This defluxion is very often occasioned by frequent variations of the atmosphere; by imprudent transitions from heat to cold; by the predominance of north winds; by journies performed in the summer through wet, unhealthy, or sandy countries; by long exposure of the eyes to the vivid rays of the sun; and similar other causes. It is not surprising, therefore, that this disease should be frequently observed to be epidemical, and to attack persons of every age and sex. In some particular cases this affection arises principally from the stomach and primæ viæ, being stimulated by unwholesome matters, as is frequent-

ly the case with those who are debilitated, or badly nourished, or who are addicted to intemperance, or the use of coarse and indigestible food. The presence of such causes is indicated by the patient's habit of body and manner of living, the nausea which he complains of, the tendency to vomit, or repugnance to every kind of animal food, pain in the head resembling hemicrania, the furred state of the tongue, fetid breath, and continual flatulency. To these causes may be added, the suppression of some periodical sanguineous evacuation, as the menstrual flux in women, the hemorrhoidal in men, or that which takes place from the nostrils.

The mild *acute* ophthalmia may be speedily cured by a proper regimen, and by purging the patient gently with a grain of the antimonium tartarizatum dissolved in a pint and a half of the decoction of the root of the triticum repens (dog-grass) taken in divided doses, and occasionally repeated for some days, provided its action is not excessive. The external treatment, supposing it to be carefully ascertained, that the disease does not arise from the introduction of any extraneous substance between the palpebræ and eye, consists in washing the part frequently with the aqua malvæ made tepid, and in the repeated application of bags of emollient herbs boiled in new milk *. If, however, from the symptoms before enumerated, the disease should appear to arise, either wholly or in part, from sordes in the stomach or primæ viæ, nothing will contribute more to the removal of it than

* These bags should be made of the finest gauze instead of linen.

the timely administration of an emetic. Whenever likewise the ophthalmia shall have been produced, either entirely or partly, by the suppression of the menstrual or hemorrhoidal flux, or of the periodical discharge of blood from the nose, great advantage will be derived from the application of leeches to the labia pudendi, or to the hemorrhoidal vessels, or in the last case to the pinnæ nasi, never omitting the use of mild and emollient applications to the eyes: and this practice should be the more assiduously pursued in proportion to the obstinacy of the inflammatory symptoms, particularly the pain and heat.

By this mode of treatment the inflammatory stage of the mild *acute* ophthalmia generally ceases in the course of four or five days; which is rendered evident by observing, that, independently of what usually takes place towards the termination of inflammation in parts which partake of the nature and actions of mucous membranes, the patient no longer complains of the troublesome sense of heat, heaviness, stiffness, and pricking in the eyes, which he felt at first; and that, on the contrary, he can open them without pain or difficulty, and bear a moderate degree of light, without its increasing the discharge of tears or gumming of the eyelids. Although, under these circumstances, the white of the eye still continues red, and appears inflamed, it is not so in reality. The ophthalmia is now to be considered as having passed from the inflammatory stage into that arising from laxity or debility of the vessels of the conjunctiva and internal membrane of the palpebræ, and the surgeon in such

cases would commit an egregious error if he were to continue the use of the emollient applications. On the contrary, he will speedily free himself from all embarrassment, if in place of these local emollient remedies, those of an astringent and corroborant nature be substituted, as the collyrium vitriolicum, or that consisting of eight grains of the cerussa acetata, six ounces of plantain water, and a few drops of the camphorated spirit of wine, dropping it into the eyes every two hours, or immerging them in it by means of an eye-glass. By these means the relaxed vessels of the conjunctiva, as well as those of the internal surface of the palpebræ, very quickly recover their former vigour and the ophthalmia entirely disappears.

In some of these cases of the benign *acute* ophthalmia, especially in those which are epidemic, from intemperance of season, the inflammatory stage is extremely mild, and terminates so quickly as to be scarcely observed. And this is, therefore, perhaps the only case of erysipelatous inflammation, as the ophthalmia is in general, in which cold and repellent applications are advantageous on its first appearance, as cold water with lemon juice or vinegar, or the white of an egg beaten with rose water and a little alum. These remedies employed in other cases of *acute* ophthalmia, though mild, but in which the truly inflammatory stage continues for some days, are exceedingly injurious.

The violent *acute* ophthalmia is attended with the same concourse of symptoms as the mild, but far more malignant and severe. In this form of the disease there is a sense of burning heat in the

eyes, spasmodic constriction of the whole eyeball and supercilium, and an intolerance even of the weakest light. The weeping is sometimes continual, copious, acrid, and mixed with mucus, which tends to produce a cohesion of the eyelids; at other times this is altogether wanting, and there is a complete aridity of the eye; the fever is smart; the pain in the whole head, and especially the neck, is insupportable; and there is total want of sleep. The pupil is also more contracted than natural, the conjunctiva appears in every part of it of a deep red colour, and the very delicate net-work of smaller vessels, which, in the mild *acute* ophthalmia, is observable upon the anterior hemisphere of the eye, among the more elevated *fasciculi* of blood-vessels, passing from one fasciculus to another, cannot be distinguished, but all are equally turgid, and as it were wound together, forming an excrescence, which is elevated upon the eyeball, and has a tendency to project between the palpebræ.

If, unfortunately, the disease make further progress, and one or more vessels, by the blood being violently thrown into them, are lacerated on the side next the eyeball, a quantity of blood is effused into the cellular membrane, which connects the conjunctiva to the anterior hemisphere of it; in consequence of which this membrane becomes gradually elevated upon the eyeball, and projects towards the eyelids, so as to conceal the cornea, which appears as if it were depressed within it. This highest degree of the *acute* ophthalmia is that which is called by surgeons *chemosis*.

The violent *acute* ophthalmia is in general principally confined to the external part of the eyeball. Occasionally the internal part of the eye is affected alone, or at least in a greater degree than the external parts of it. When the disease affects the internal part of the eye, it is indicated by the violence of the pain felt at the bottom of the orbit, not corresponding at the moment to the changes which take place in the conjunctiva and eyelids. I say at the moment, because the internal ophthalmia is in general very soon succeeded by an inflammation of the external parts of the eye also. From considering, therefore, the small alteration which appears externally, the great aversion which the patient has, even to the weakest light, the red appearance of the iris, the great contraction of the pupil, and occasionally the red and turbid state of the aqueous humor, it is not unreasonable to suspect, that in the highest degree of this disease, as in that which affects the external parts, there is an extravasation of blood into the chambers of the eye, but more particularly between the choroid and sclerotic coats, to which cause the generally unhappy issue of the internal ophthalmia ought to be attributed, rather than to any other, which, unless it produce a suppuration of the eye, generally terminates in amaurosis.

The violent *acute* ophthalmia demands the most rigorous prosecution of the antiphlogistic plan of treatment in its full extent. Experience has shewn, that a delay in the employment of evacuations, and especially the neglect of taking away a sufficient quantity of blood, are the principal causes of the

disease attaining the state of chemosis, and threatening either the formation of matter, or the effusion of coagulable lymph within the eye, or at least degenerating into the obstinate *chronic* ophthalmia, from the excessive distension of the vessels of the conjunctiva during the inflammatory stage *. In all cases, therefore, of the violent *acute* ophthalmia, blood should be taken away quickly and abundantly from the veins of the arm or foot, in proportion to the age and temperament of the patient, and afterwards, according to circumstances, from the neighbourhood of the eyes, by means of leeches applied in the proximity of the eyelids, especially near the internal angle of the eye upon the angular vein at its junction with the *vena frontalis, orbitalis profunda*, and *transversalis faciei*; always premising, however, the previous abundant evacuations of blood from the arm or foot †. And if the disease shall have appeared in consequence of the suppression of some periodical sanguineous discharge, as that of the nose, uterus, or hemorrhoidal vessels, instead of applying the leeches round the eyelids, it will be more advantageous to apply them in the first case upon the *pinnæ nasi*, and in the others to the internal part of the *labia pudendi*, or to the hemorrhoidal veins. In the case of a young woman,

* See upon this subject the precepts and practical observations of Galen. De curat. rar. per sanguinis missiones. Cap. 17.

† It appears not a little extraordinary, that no mention is made of the division of the anterior branch of the temporal artery, or rather that this mode of taking away blood should not have superseded the employment of general bleeding from the veins of the arm or foot.—TRANS.

19 years of age, who not long since was attacked with a violent inflammation in both her eyes, a little after the sudden suppression of the menses, the application of leeches to the internal part of the *labia pudendi*, after a copious evacuation of blood from the arm, produced so good an effect, that in less than twenty-four hours the inflammation abated, and the patient was greatly relieved. I have frequently had occasion to remark the same thing in cases of the violent *acute* ophthalmia, in consequence of the suppression of the periodical hemorrhoidal flux, as well as of that of the nose.

The general and local abstraction of blood, although copious, is not always sufficient to produce a speedy diminution of that highest degree of the disease, which is termed *chemosis*. In such urgent cases recourse must be had to some other expedient, in order to produce a speedy discharge of the blood which is extravasated in the cellular membrane, connecting the conjunctiva to the anterior hemisphere of the eye, by which this membrane is enormously elevated and distended. This consists in the circular excision of the projecting portion of the conjunctiva with the curved scissors, at the part where the cornea and sclerotica unite; by means of which not only the whole of the blood which is extravasated under the conjunctiva is discharged, and with immediate relief to the patient, but also that, which, notwithstanding the abundant general evacuations of blood, might still greatly distend the vessels of this membrane. This operation is infinitely preferable to scarification, which is practised in such cases by the greater part of surgeons; since

the latter is not sufficient to discharge the blood which is extravasated under the conjunctiva, and rather increases than diminishes the irritation, and the determination of blood to the eye*.

After the abundant general and local bleedings, the patient's bowels should be purged by mild antiphlogistic aperients, as the pulp of the tamarind, crystals of tartar, tartarized kali, or vitriolated magnesia; and in cases of sordes of the stomach, an emetic should be given without hesitation; that is, for an adult, two scruples of ipecacuanha with a grain of the antimonium tartarizatum; the patient should afterwards be directed to take for several successive days, in divided doses, a grain of tartarized antimony, with two drams of crystals of tartar, dissolved in a pint of the decoction of the radix tritici repent. (dog grass) or milk whey.

Among the best external remedies, especially in plethoric subjects, and after a sufficient quantity of blood has been taken away, and the

* With the view of arresting the rapid progress of the *acute* ophthalmia, Mr. Wardrop proposes to discharge the aqueous humor by puncturing the cornea with a straight double-edged needle, or with the point of the ophthalmic bistoury. With respect to the utility of this practice, I am at present unable to say any thing. The observations of the author tend to prove, that the evacuation of the aqueous humor, although momentary, is sufficient to take off the violent distension of the eyeball, and consequently procure an abatement of pain. I say momentary, as every surgeon knows that the aqueous humor is renewed, and the chambers are filled again in a few minutes. But of what force is theoretical reasoning against practice.

On the Effects of evacuating the aqueous Humor in Inflammation of the Eyes.

bowels opened*, is deservedly ranked the application of a blister to the neck. Not, however, because the blister produces a discharge of serum from the part to which it is applied, but because it excites a consensual irritation, which suspends, as it were, the morbid process, by transferring it to the part which is artificially stimulated; and it is known, from observation, that the neck and back part of the ear are the parts which more readily sympathize with the eyes than any other part of the head; in the same manner as the lobe of the ear with the teeth, the peritonæum with the urinary bladder, and the skin of the abdomen with the viscera contained in it, &c. To this must be excepted, however, the case of ophthalmia depending altogether on disorder of the alimentary canal. For experience has confirmed the doctrine of Bonetus and Riverius, that in affections of the eyes depending on abdominal derangements, blisters and cupping on the neck are rather injurious than beneficial.

With respect to the local remedies to be applied in acute inflammation of the eyes not arising from a specific virus, the use of mild and emollient applications should never be departed from, as bags of mallows boiled in new milk, or a poultice of bread and milk with saffron, the pulp of roasted apples, a strong decoction of poppy-heads,

* Hoffman Medicinæ ration. system. t. iv. part 1. sect. 2. Setacea et vesicatoria non facile applicanda in plethoricis, nisi soluta prius plethora; et alvo præsertim in cacochymicis, subducta.

and others of that class, which ought to be renewed every two hours, or oftener. In order to moderate the excessive heat which is felt in the eyes, nothing is more advantageous than introducing with the point of a probe between the eyelids and ball, the white of a fresh egg, or the mucilage of the psyllium prepared in the distilled water of mallows. The patient should be recommended to lie in bed with his head as much raised as possible, and not to do any thing which may impede or interrupt his perspiration. If the edges of the eyelids should have much tendency to cohere, especially during the night, they should be smeared at bed-time with a liniment consisting of oil and wax; as nothing contributes more to aggravate the painful effects of the disease, than the confinement and redundancy of the scalding tears between the ball of the eye and the palpebræ*.

By the timely employment of these efficacious means, the inflammatory stage of the violent *acute* ophthalmia is in general subdued on the fifth, seventh, or eleventh day. This is marked by

* Sed neque ad multum tempus claudere oculos conducit, maxime si fluxionem calidam habeat. Lachryma enim suppressa calefacit. Hippocrat. *de visu.*

Some persons endowed with extreme sensibility, whose eyes are very prominent, cannot endure the smallest pressure on them when inflamed. In such instances, instead of the application of poultices or fomentations, it is preferable to make use of emollient and anodyne vapours conveyed to the eye by means of a funnel adapted to a small vessel kept in a boiling state by means of a spirit-lamp. This application ought to be repeated every two hours at least, and continued for 15 or 20 minutes, the eye being held at such a distance as not to be incommoded by the heat of the vessel.

the entire cessation of fever, by the patient no longer complaining of the burning heat or lancinating pains in the eyes; by the subsidence and flaccidity of the eyelids, and by the patient in general becoming easy, and having a return of his appetite. The eyes, which before were either entirely dry, or poured out a thin and acrid serum, now discharge a quantity of mucous matter, which affords relief, the patient opens and shuts the eyelids without much difficulty or aversion to a moderate degree of light, and, lastly, the humors are not rendered turbid by extraneous matters.

On the appearance of these symptoms, notwithstanding the redness and tumefaction of the conjunctiva still continue, it will be proper to desist from debilitating the patient any further, and instead of emollient and relaxing applications, (except in cases where the excision of the conjunctiva has been requisite, of which I shall speak afterwards) it will be proper to substitute those of an astringent and corroborant nature*, as a colly-

* With the greatest deference to the opinions of the author, I must be allowed to state, that the practice which has appeared to me most advantageous under these circumstances, as far as regards the local treatment, has been the daily abstraction of a small quantity of blood from the lower eyelid by scarification. This is best performed by previously insinuating a drop or two of the vinous tincture of opium between the eyelids by means of a camel's hair brush; and after the momentary uneasiness arising from it has ceased, dividing the vessels of the conjunctiva of the eyelid by a single stroke from the inner towards the outer angle with a broad-edged scalpel, which is preferable to the point of a lancet. The effect of this application is to produce a slight turgescence of the vessels of the conjunctiva, and consequently a larger flow of blood than could be obtained without it. The relief which almost immediately follows, and the speedy subsidence of the

rium consisting of the acetated cerus and distilled plantain water, or composed of six grains of vitriolated zinc, six ounces of distilled water, one ounce of the mucilage of quince seed, and a few drops of camphorated spirit of wine, which should be insinuated between the eyelids every two hours, and the eyes immersed in it by means of an eye-glass. It should be observed that persons are occasionally met with who cannot bear cold applications to the eyes, especially in winter. In such cases the collyria should be used at first tepid, and the temperature gradually diminished, until the patient's excessive sensibility is allayed, and they can be employed entirely cold.

A very efficacious remedy in this state of the disease, or when after blood has been taken away copiously, and the bowels evacuated, the violent *acute* ophthalmia has passed into the second stage, or that arising from local debility, is the Tinctura Thebaïca of the London Pharmacopœia*,

disease, have led me to persevere in this treatment either daily or occasionally at longer intervals, as long as any appearance of inflammation remains on the eye. What share of this beneficial effect is to be attributed to the use of the tincture of opium alone, I do not undertake to determine; but of the success of the practice I am fully satisfied. TRANS.

* Rec. Opii colati unciam unam.
Cinnamom.
Caryophyl. arom. an. drachmam semis.
Vin. alb. merac. libram semis.

Macera per hebdomadam sine calore; deinde per chartam cola. Adde, postquam colata sunt, spiritus vini tenuioris vicessimam circiter partem, ut tutiora sint a fermentatione. Reponere oportet vitreis ampullis accurate obturatis.

This tincture may be rendered less stimulating, by increasing

two or three drops of which may be instilled between the eyelids twice a-day, or only at night for several successive days, and till the patient is completely cured. At the moment this remedy is diffused over the eye, it generally produces considerable heat and uneasiness; but this quickly subsides, and on the following morning the eye is found in a clearer and much better state. It is necessary, however, to observe again, that this application, which is so useful in the second stage of the disease, is exceedingly injurious in the first, or inflammatory stage, and that consequently it ought never to be employed until after copious general and local bleeding, and evacuation of the bowels, and in short until the inflammation has entirely ceased*. I can aver, from my own experience, that what Mr. Ware has asserted of the utility of this remedy, when employed with caution, and at a proper period, is not at all exaggerated.

When the surgeon has been under the neces-

the quantity of opium in it. And in using it, instead of letting it fall directly upon the eyeball, it is better to insinuate it at the internal angle, so that it may diffuse itself slowly over the rest of the eye. The substitution of the tincture of opium for it in such cases is a great error.

* *Chirurgical Observations on the Ophthalmy, by James Ware.* But the speedy advantage of this remedy is not to be expected in all cases indiscriminately. In some the amendment is more slow and gradual, requiring the tincture to be made use of for a much longer time; and a few instances have occurred in which no relief at all was obtained from its first application. In cases of the latter kind, in which the complaint is generally recent, the eyes appear shining and glossy, and feel exquisite pain from the rays of light. P. 52.

sity of making a circular excision of the conjunctiva, in order to prevent the progress of the chemosis, he should recollect that after the inflammatory stage of the disease is over, the ulceration produced upon the eyeball, at the junction of the cornea and sclerotic coat, must contra-indicate the use of irritating and astringent collyria, since they would exasperate the disease, and give occasion to a renewal of the inflammation. In such cases he must be satisfied, after the inflammation has been dissipated, with promoting the suppuration of the wound, by washing the eye frequently in the course of the day with mallow-water or new milk. The suppuration will present itself by a layer of mucus spread over the whole of the whitish circular zone, which remains after the division of the conjunctiva; which zone, towards the decline of the second stage of the disease, will gradually contract and heal, without leaving any vestige of the wound made in the conjunctiva.

Lastly, as soon as the patient is in a state to support a moderate degree of light without inconvenience, every kind of covering and incumbrance should be removed from the eyes, except a piece of green, or black taffeta, which should be suspended from his forehead, in order that under this defence he may be at liberty to open and shut his eyelids at pleasure, and move the eyeball freely. Those who are about the patient should be also directed gradually to admit a greater degree of light every day into his chamber, that he may habituate himself to it as

quickly as possible, and be able to face the full light. For it is a certain fact, confirmed by experience, that nothing contributes more to keep up and increase the morbid sensibility of the organ of vision, and consequently to prolong the disease, than obliging the patient to lie unnecessarily in a room completely dark, or with his eyes closed and covered with a bandage, longer than the nature of the case requires.

What has been already delivered, relative to the phænomena and treatment of the violent *acute* ophthalmia in both its stages, will be sufficient, in my opinion, to serve as a certain guide to the young surgeon in the management of this disease, although it should occasionally be attended with some other symptom which is not usual; I cannot, however, omit to mention a particular species of the violent *acute* ophthalmia, which is distinct from the common in this respect, that although the inflammation and swelling of the eyelids and conjunctiva come on with great intensity, like the other cases of ophthalmia of this species; yet a short time afterwards it is attended with an extraordinary copious discharge of matter from the eyes of a puriform appearance. This disease, as it is most commonly met with in infants, a little after their birth, or attacks adults in consequence of a sudden suppression of the virulent gonorrhœa, or of a translation of the venereal poison in some other manner to the eyes, is called, in the first case, the *puriform ophthalmia of infants*; in the second, the *acute gonorrhœal ophthalmia*.

The first, as I have said, attacks infants a little after their birth, or those of an early age, while at the breast. On the appearance of this alarming disease, the eyelids become at once enormously swollen, and in such a degree that they cannot be separated from each other, much less turned outwards. And if this is effected with difficulty, the internal membrane of the palpebræ is found converted into a villous, fungous substance, similar in some degree to the *intestinum rectum*, when it is forced out and everted in children from excessive straining. The eyelids, during the crying of the infant, are occasionally everted of themselves, and remain in that state until they are returned by force. When the first shock of the inflammation is over, which is of short duration, a most extraordinary quantity of puriform mucus is continually discharged from the eyes, which is partly secreted by the ciliary glands, but the greater part of it by the villous and fungous substance into which the internal membrane of the eyelids and conjunctiva is converted. The fever, at the commencement of the disease, is smart; the cries of the infant, the restlessness, and tremors of the whole body, are incessant; and with these symptoms, is frequently associated a vomiting or purging of very offensive yellowish matter.

Practitioners differ with respect to the causes which give rise to this formidable disease. Some think that it ought to be attributed to the sudden exposure of the infant to cold; others, on the contrary, to excessive heat from the fire and the child's dress; others to the strong irritation of a very vivid

light on the delicate organ of sight; others derive the disorder from leucorrhœa affecting the mother during her pregnancy and labour; others, lastly, from the existence of gonorrhœa, with or without ulcers in the vagina of the mother, or from the presence of some other discharge of acrid matter from those parts. Of all these opinions, that which is most supported by facts and therefore most probable, is, that the disease is derived from an acrid source applied to the eyelids and edges of the tarsi during the passage of the head of the child through the vagina, in labour. The reasons which influence this opinion, are, that the appearance of the *purulent* ophthalmia generally coincides with the presence of the *fluor albus* in the mother, and that the ophthalmia is most violent when this discharge from the vagina is syphilitic, and accompanied with ulcers of the vagina or external pudendum. Nor, because instances of *purulent* ophthalmia are met with in infants born of mothers free from leucorrhœa, and of others not affected with the disease, although the mother might have had the fluor albus for a considerable length of time, can it be safely concluded that this is not the most frequent cause of the disease; for supposing the leucorrhœa to be slight, and sometimes also to return only at intervals, it may have been regarded by the parent as a thing of no consequence, and its existence consequently denied; or, because, as we see happen in the propagation of contagious disorders, some individuals though equally exposed to their influence, are nevertheless exempt from them. It may also be observed, that the *purulent* ophthalmia of infants is more

frequent among the poorer class of people than the rich, and that it is particularly so in the hospitals for foundlings, in consequence, as it would seem, of the cleanliness of the higher orders rendering the discharge less acrid. And it is unquestionable, that when the discharge is syphilitic or very acrid, from any other constitutional disorder, the *purulent* ophthalmia arising from this source is violent beyond all others; and it is besides worthy of observation, that this affection of the eye in children is contagious. Neither can it be supposed that the water of the amnios is sufficient to wash off so completely the acrid mucus firmly adhering to the vagina, that a sufficient quantity of it may not remain to come in contact with the edges of the eyelids of the fœtus succeeding the discharge of the waters.

Yet, however probable this opinion may be with respect to the causes which give origin to the *purulent* ophthalmia of infants, prudence will not permit us to exclude entirely those before enumerated. It would be therefore desirable, that in the instructions given to midwives, it should be enjoined as a constant rule, that they should wash the whole body and face of the new-born infant with warm water and wine; and that the eyelids and surrounding parts particularly should be cleansed with warm mallow-water for several successive days And also, that the infant should not be exposed, even for a short time, to the cold or damp air, nor to too hot a fire; nor, lastly, placed where the tender eye may be impressed with too vivid a light.

When, however, the disease has taken place, if a prompt and efficacious treatment be not employed to restrain this immoderate discharge of puriform mucus from the eyelids and conjunctiva of infants, the cornea in a short time loses its transparency, becomes thickened, and a *staphyloma* is produced. On the first appearance of the disease, therefore, the antiphlogistic plan of treatment should be put in practice, by taking away blood from the infant, either by means of the lancet, or by the application of leeches to the temples. Afterwards a blister applied to the neck will be found very useful, especially if the disease have been preceded by the retropulsion of any eruption upon the head. It will be proper also to purge the infant with syrup of succory, conjoined with rhubarb and a little magnesia, directing the nurse at the same time not to overload the child's stomach with milk or other food as is usual, nor to swathe it tightly, and dress it in heavy clothes, as is the custom with our ladies, even in the hottest weather. And if there be any reason to believe that it is in part occasioned by the nurse's milk being bad, she ought to be changed, or the disease, whether depending on the state of her stomach or constitution, corrected.

In the poorer class of people this disease is most frequently met with in the second stage, or after the inflammatory period is over, and the copious puriform discharge has taken place. If it should happen to be observed on its first invasion, besides the general remedies already mentioned, the eyelids should be covered with bags of very fine gauze

filled with emollient herbs boiled in milk and sprinkled with camphire; or with bread and milk with saffron, or the pulp of roasted apples sprinkled with camphire, in order to moderate the violence of the inflammation. As soon as the puriform mucus is copiously discharged from the eyes, which marks the commencement of the second stage of the disease, recourse must be had to astringent and corroborant applications, in order to restore the vessels of the eyelids and conjunctiva to their former vigour, to repress the fungous and villous state of the internal membrane of the eyelids, and thereby check the morbid and immoderate puriform secretion, from which it is principally derived. For this purpose the most useful and efficacious application is the introduction of the *aqua camphorata* between the eyelids and ball of the eye. This water is composed of equal parts of the cuprum vitriolatum and Armenian bole, and of a fourth part of camphire, well pulverized and mixed together. One ounce of this powder is put into a pint of boiling water; it is then taken from the fire, and after being allowed to stand a little until the heaviest parts subside, is decanted. The *camphorated water* thus prepared is used at first, by putting a dram of it into two ounces of cold distilled plantain water, afterwards increasing the dose of it according to circumstances. This collyrium is injected by means of a small ivory syringe, the point of which is carefully introduced between the eyelids at the external angle of the eye. In the worst cases it ought to be employed

every hour, and in those of less magnitude two or three times a day. The eyelids are afterwards covered with a piece of linen spread with the white of an egg beaten and inspissated with alum, and the cohesion of the tarsi is prevented by frequently anointing the edges of the eyelids with pommade, or oil and wax.

By this method of treatment, in the course of a fortnight the copious discharge of puriform mucus from the eyes generally ceases, the eyelids subside, and the surgeon is now able to determine precisely the state of the eye, and particularly that of the cornea. If there should be any opacity of the latter, the most proper remedy for removing it is the Tinctura Thebaïca of the London Pharmacopœia, or if this is not at hand the ophthalmic ointment of Janin.

The violent acute *gonorrhœal* ophthalmia is very similar to the *purulent* ophthalmia of infants, with respect to the violence of the inflammation, the copious discharge of puriform mucus from the eyes which shortly succeeds it, and the tendency which the disease has to destroy the organ of vision; but it differs from it in some respects, with regard to the cause by which it is produced.

This disease is occasioned in two ways. The one takes place in consequence, or at least after the sudden suppression of the virulent gonorrhœa; although every suppression of gonorrhœa is not constantly succeeded by the appearance of such ophthalmia. The other is produced by the insertion of the matter of gonorrhœa, inadvertently conveyed from the genitals to the eyes.

On the sudden suppression of the gonorrhœa, which usually takes place in consequence of violent exertions of the body, the abuse of spirituous liquors, long exposure to an excessive degree of cold, and of acrid and astringent injections thrown into the urethra, or other similar causes, the ophthalmia commences with great tumefaction of the conjunctiva rather than of the eyelids; not long after, a copious and continual discharge of greenish yellow matter issues from the eyes, similar to that of the virulent gonorrhœa; the disease is attended with great feverishness, restlessness, a burning heat, and acute pain in the eyes and head, and an intolerance of light, and in some cases also an incipient *hypopion* appears shortly afterwards in the anterior chamber of the aqueous humor. In the second case the same effects are produced, when the patient incautiously inserts the virus, by rubbing his eyes with his fingers, or a cloth imbued with the matter of gonorrhœa; with this difference however, that the symptoms before enumerated are not so violent, and the inflammation so excessive in this instance as the former.

The greater part of surgeons are of opinion that in the first case there is a true metastasis of the matter of gonorrhœa from the urethra to the eyes. But to others this theory has appeared unsatisfactory, and in my opinion with much reason. For the *puriform* ophthalmia does not always succeed the sudden suppression of the gonorrhœa; on the contrary, its occurrence may be considered as rare, in proportion to the frequency of cases in which the disease is suddenly suppressed or repelled. In

the second place the confirmed lues is never seen to succeed such metastasis of the gonorrhœa to the eyes *. In the third place the gonorrhœal ophthalmia from inoculation with the virus, in which case no doubt can be entertained that the venereal poison is the cause of the disease in the eyes, has never the same powerful and immediate tendency to destroy the organ of vision, as that which is derived from the gonorrhœal metastasis. Perhaps they approach nearer the truth, who regard this phænomenon rather as the effect of a direct consent between the urethra and eyes, than as a real translation of matter; the internal membrane of the urethra and of the palpebræ, as well as those of the fauces and rectum, being productions of the cutis; and if this effect does not take place in every case of sudden suppression of gonorrhœa, it is because all individuals are not endowed with the same degree of consensual sensibility †.

* The same thing is remarked by Bell, *on Gonorrhœa virul. v.* 1. *chap.* i.

† For the following note on this subject, I am indebted to Mr. Pearson, to which I have thought it proper to subjoin the Author's reply:—

" The venereal ophthalmia, or what Professor Scarpa calls the gonorrhœal ophthalmia, whether ascribed to metastasis, sympathy, or the application of the matter of gonorrhœa to the eye, is a disease which has been described by a considerable number of those writers who have treated professedly on venereal complaints; but whether the greater part of them have given the result of their own observations, or have merely transcribed from the works of their predecessors, is a question deserving some consideration.

" Although I am fully disposed to treat the talents and accuracy of Professor Scarpa with the utmost deference, yet I cannot

However this matter may be, on the first appearance of this disorder, the primary indication is to subdue the violence of the inflammation as quickly as possible, in order to prevent the destruction of

help entertaining some doubts of the propriety of assigning the gonorrhœa as a cause of ophthalmia; since, during a pretty extensive experience of twenty-five years, I have never seen one single instance of an inflammation of the eyes, which was evidently derived from a gonorrhœa. I am sufficiently aware of the nature and force of negative evidence in matters depending on testimony, not to over-rate it; and certainly, to deny the existence of any attested fact, merely because it has not occurred in the course of a man's own experience, would be hasty and unjustifiable. In the instance now before us, there are two points to be considered: the testimony of a respectable Professor, and the validity of his opinion; for it is not only asserted, that those who are infected with a gonorrhœa may be attacked by a violent ophthalmia, but that the gonorrhœa is somehow or other the cause of that ophthalmia. It is with reference to the latter proposition, that I express my doubts, which are founded upon the fact mentioned before, that, of the many thousand cases of gonorrhœa which have fallen under my notice, I never could, in any one instance, trace such a connexion between the eye and the urethra, as that to which Professor Scarpa alludes.

"The puriform ophthalmia of infants, was, within my recollection, generally regarded as an indication of a venereal taint; and much unnecessary distress was often excited in families, and very improper treatment was frequently pursued in consequence of this erroneous opinion. The nature of that complaint, and the proper method of treating it, are now much better understood, and I conceive, that mistakes in these cases are not very common at this time.

"In that form of the secondary symptoms of syphilis, where the skin is the part chiefly affected, a disease resembling the ophthalmia tarsi sometimes appears. It is not commonly attended with much redness of the tunica conjunctiva, nor is the sensibility of the eye to light remarkably increased: yet I have seen it, in a few instances, in the form of an acute ophthalmia, resisting all the common modes of treatment, but yielding immediately to a course of mercury.

the eye or the opacity of the cornea. Consequently, as I have said before, in young and plethoric subjects, blood should be taken away abundantly, not only generally but locally, by means of leeches, allowing it to flow in sufficient quantity; it will be proper to employ mild laxatives, cooling drinks, emulsions of gum arabic, the warm bath, or at least the pediluvium, and blisters to the neck. The patient ought to lie in bed with his head raised, and the eyelids covered with a piece of linen cloth wet with the compound litharge water. On the first appearance of the puriform discharge, a small quantity of mallow-water should be injected between the eyelids and ball of the eye, two or three times a day, by means of a small ivory syringe, in order to cleanse the parts; and the *camphorated water* immediately afterwards employed precisely as in the treatment of the *purulent* ophthalmia of infants. The surgeon should also direct that a large poultice of bread and milk with saffron be applied upon the perinæum, and renewed every two hours, and that warm oil be injected into the urethra several times

"The venereal ophthalmia resembles, in its appearance, those diseases of the tarsi and tunica conjunctiva, which are derived from scrofula: and I believe, there are no specific characters by which diseases of the eye, or eyelids, produced by the action of the venereal virus, can be distinguished from those which are excited by other causes."

In reply to these observations, the author, in a letter to the translator, says, "I have read with great pleasure the remarks made on this passage by Mr. Pearson; since the publication of the work I have been satisfied that the metastasis of gonorrhœa to the eye is a chimera; but with respect to the possibility of the venereal ophthalmia from contact, I have had the most certain and convincing proofs."

a day, introducing after each injection a simple bougie, with the view of reproducing the gonorrhœal discharge*.

When the inflammatory stage of the disease is subdued, which, as I have several times observed, is indicated by the cessation of fever, the burning heat and acute pain in the eyes, and by the diminished tumefaction of the eyelids, although the fulness of the vessels of the conjunctiva, and the abundant discharge of puriform mucus from the eyes continue as at first, the surgeon, nevertheless, should persevere in the use of astringent topics, employing a collyrium, consisting of one grain of the hydrargyrus muriatus dissolved in ten ounces of the aqua plantaginis, which should be dropped between the eyelids every two hours; and if this application be too irritating, it ought to be diluted by adding a little mucilage of the seeds of the psyllium. Great advantage may also be expected from the use of the tinctura thebaïca. This treatment, however, is proper only in cases where the excision of the conjunctiva has not been requisite, for when this operation has been executed, the use of stimulant and astringent applications, at least those of the strongest kind, ought to be desisted from in the second stage of this, as well as of every other species of ophthalmia. The same treatment is equally applicable to the gonorrhœal ophthalmia, when it is produced by the insertion

* Schmucker imagines that a powder consisting of gr. vj of Rhubarb and ℈ j of nitre, taken every three hours, contributes greatly to reproduce the gonorrhœa, when suddenly suppressed. See upon this subject also *Mémoires de la Societé d'Emulation de Paris*, Tome v. p. 449.

of the matter; except that in the latter, no applications are necessary to cause a return of the discharge from the urethra, and that the local stimulant and astringent remedies succeed better in this case in the solid than the liquid form, as the common mercurial ointment smeared upon the edges of the eyelids, or instead of it, the ophthalmic ointment of *Janin*.

Besides the *purulent* ophthalmia of infants, and the *purulent* venereal ophthalmia which I have just described; there is another affection similar to them, which attacks subjects of every age, and is manifestly propagated by contagion. Of such character was the malignant and contagious ophthalmia which diffused itself through the English and French troops in the expedition to Egypt. Mr. Ware * does not hesitate to affirm, that this disease

* Remarks on the Purulent Ophthalmy. London, 1808.

It is said that among the natives of the country in general, who are of a very weak constitution, the contagious ophthalmia never assumes the *acute* inflammatory character; and that therefore bleeding, and the repeated use of purgatives are injurious. FRANK. *Collection d'opuscules de Med. Prat. de l'ophtalmie d'Egypte*.

The English and French surgeons were unfortunately not aware *that in order to dissipate the local inflammation, and to deterge the eye from the infectious properties of the disorder,* a collyrium as a *counterstimulant* was useful, formed by a solution of 10 or 15 grains of the Tartarum stibiatum in a pint of water, with which remedy VASANI says that he has performed prodigies in the cure of the contagious purulent ophthalmia of Ancona. But these practitioners knew nothing of *counter-stimuli,* they knew very well that a wash of the tartar. stibiat. similar to this collyrium, caused inflammation of the skin, and produced vesicles and pruriginous pustules; consequently it would never have entered their thoughts to *counterstimulate* with so powerful a *stimulant.* I shall not be surprised to hear shortly that the *acute* and *chronic* inflammatory ophthalmia has been cured by the tincture of can-

was conveyed from one individual to another by the incautious application of the specific virus to the conjunctiva. The author thinks he had observed also, that, in several European patients attacked by it, there was a remarkable sympathy between the eyes and urethra. The symptoms of this disease were a copious *purulent* discharge from the eyes, tumefaction of the eyelids, conjunctiva and eyeball, and a rapid tendency to opacity and ulceration of the cornea. The remedies which were most useful according to this writer were purgatives and bloodletting, in robust plethoric habits, contrary to that among the natives; and the prompt application of astringent collyria to the eye, precisely as in the treatment of the *purulent* ophthalmia of infants, or that arising from gonorrhœa just spoken of*. Mild emollient applications

tharides, as according to the champions of the new unintelligible hypothesis of *counter-stimuli*, there is no real difference between these two stages of the disorder.

* For an account of the contagious ophthalmia of Egypt, and particularly the extension of this formidable disease among the troops in Italy, the phænomena with which it was accompanied and the plan of treatment which was found most effectual: see the dissertation of Dr. Omodei *Cenni sull'ottalmia d'Egitto, &c.* a work replete with valuable erudition and important practical remarks. The author shews that this disease, which is unquestionably contagious, has not appeared with so much virulence in England and Sweden, as in some parts of Italy, and especially in Ancona, where from circumstances which it is not always possible to determine, in this as in other contagions, the acute stage was of longer duration than elsewhere; when the acute stage however was overcome, astringent and repellent collyria were useful, as the solution of zinc in water mixed with vinegar; the muriate of soda dissolved in water with a little vinegar, a weak solution of sugar of lead, camphire or white vitriol in water; a coffee spoonful of lemon juice, with two of ARRACK in 4 table

were found injurious on the appearance of the purulent stage, as they are equally in that of the ophthalmia of infants, or of the *gonorrhœal* from contagion.

Hitherto I have spoken of the two stages of the benign and violent *acute* ophthalmia, and of the treatment which each of these periods requires. But, although the second stage of the violent acute ophthalmia, or that which depends on the atony of the vessels of the conjunctiva, and palpebræ, is most frequently speedily cured by the use of astringent and corroborant applications;

spoonsful of water, the *lapis divinus* of Janin with the addition of a little acetate of lead, a solution of corrosive sublimate in water, opium in the form of tincture, &c. that is to say, nearly as in the local treatment of the *purulent* ophthalmia of infants, or the gonorrhœal from the insertion of matter between the eyelids [1].

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[1] After making trial of a variety of applications in those cases of what is called *Egyptian ophthalmia*, in which there is a prodigious discharge of matter from the eye; by far the most powerful and effectual means which I have found of checking it, has been the introduction of a very minute quantity of the *oleum terebinthinæ*, proportioned to the age and sensibility of the patient, on the point of a camel's hair-pencil between the eyelids every morning, the eye being immediately afterwards immersed or bathed freely in cold water with a sponge, until the uneasiness and sense of heat which it produces in the eye and surrounding parts is allayed, which usually continues for some minutes. Where the profuse discharge arises merely from the highly vascular fungous state of the conjunctiva, and is unconnected with any other disordered state of the parts, the abatement of the symptoms, particularly the discharge of matter, and the puffiness of the eyelids, disappear by this means with surprising rapidity. My object, however, here, is to point out this application as a remedy for that state of the eye denominated *purulent*, without any reference to the cause from which the disorder may have originated. It must be unnecessary to add, that its use can only be proper after the entire cessation of the *acute* stage of the disease.—TRANS.

yet cases are occasionally met with in practice, in which, from an unfavourable combination of causes, the second stage of this disease is protracted to a length of time, until it becomes in the strictest sense *chronic*, and threatens the slow destruction of the organ of vision.

This unfavourable combination proceeds from three principal sources; either from an increased sensibility and irritability remaining in the eye, after the cessation of the *acute* stage of the ophthalmia; from some other disease in the eye, of which the ophthalmia is only a consequence; or, lastly, from some particular predisposition of the patient's general constitution.

That the morbid increase of sensibility in the eye is the cause of the disease being kept up, is inferred from the discharge not only resisting the use of astringent and corroborant applications, which produce such speedy and beneficial effects in cases of simple debility of the vessels of the conjunctiva and eyelids; but also from the disorder being aggravated by the use of these remedies, or even by cold water alone: from the patient's constantly complaining of a weight and great difficulty in raising the upper eyelid: from the conjunctiva having constantly a yellowish appearance: and from its becoming instantly bloodshot, on the patient's exposing himself to a damp cold air, or to a more vivid light than usual, or on attempting to read or write by candle light. If, in addition to all this, the patient's habit is weak and irritable; if he is subject to frequent attacks of hemicrania, to restlessness, convulsions, spasmodic tension of

the hypochondria, or flatulency; under these circumstances it is evident that the *chronic* ophthalmia is not only kept up by a morbid increase of sensibility in the organ of vision, but also by a general nervous affection, in which the eyes participate.

With respect to the diseases of the eye, from which the *chronic* ophthalmia is derived; besides the presence of an extraneous body between the palpebræ and ball of the eye, which has passed unobserved by the surgeon, are reckoned the inversion of one or more hairs of the eyelids, or caruncula lachrymalis; a small abscess or ulcer in some part of the cornea; the protrusion of a portion of the iris; herpetic ulceration of the edges of the eyelids; the tinea of the eyelids; a vitiated secretion of the ciliary glands; the morbid enlargement of the cornea or of the whole eyeball *.

* To the causes of chronic inflammation of the eye here enumerated, may be added, a *diseased state of the conjunctiva of the eyelids*, which has been more particularly noticed of late, as a consequence or stage of what has been called the *Egyptian ophthalmia.* The inner surface of the eyelid becomes fungous or *granulated*, and by degrees indurated, and unequal, and towards the angles of the eye frequently puts on a ragged or fringe like appearance. This diseased state of the lid is sometimes not merely confined to the membrane investing it, but extends to the tarsal cartilage, which has the feel and appearance of parchment or horn. The irritation which this unequal surface necessarily produces by its friction upon the eyeball, occasions a turgid state of its vessels, and at intervals considerable inflammation, attended with greater or less opacity of the cornea. It must be obvious that the cure of the disorder from this source, can only be effected by the removal of the diseased state of the eyelid, either by means of excision with the knife or scissors, or by the use of escharotic or astringent applications. Celsus has several allusions to this morbid state of the eyelid, under the term *Aspritudo* palpebrarum or *Scabrities*

The chronic ophthalmia has sometimes been observed to arise from the presence of insects, and more especially of the *pediculus ferox pubis* lodging at the roots of the hair of the eyelashes and eyebrow. At the end of Guillemeau's treatise on the diseases of the eyes, a case of this sort is mentioned, and others similar to it are found related in the 24 vol. of Corvisart's Journal, August 1812. I have seen also one instance of it. It was only by examining the roots of the hairs with a very powerful lens, that I was able to discover the true cause of the intractable disease, which was speedily put an end to, by applying the mercurial ointment on the edges of the eyelids and eyebrow, with the point of the finger.

As to the diseases of the general constitution, the cure of the second stage of the violent *acute* ophthalmia is most frequently retarded or prevented, either by a scrofulous predisposition, or by an obstinate variolous metastasis to the eyes, and occasionally by the inveterate lues venerea. The symptoms of these are so well known, even by students in surgery, that it would be unnecessary here to repeat them.

oculi, and appears to have been well acquainted both with the nature and treatment of it, as is evident from the following passage:

"Non nunquam etiam ex aspritudine lippitudo, (i. e. ophthalmia) fit, deinde aspritudinem ipsam auget, fitque ea in aliis brevis, in aliis longa, & quæ vix unquam finiatur. In hoc genere valetudinis quidam crassas durasque palpebras & ficulneo folio, & asperato specillo & interdum *scalpello* eradunt, versasque quotidie medicamentis suffricant: quæ neque nisi in magnâ vetustâque aspritudine neque sæpe facienda sunt, nam melius eodem ratione victûs & idoneis medicamentis pervenitur," &c. Lib. 6. Cap. 3. Sect. 2.—Trans.

In cases of *chronic* ophthalmia, kept up by an excess of partial or general sensibility, the internal administration of the bark, conjoined with valerian root, animal food of easy digestion, gelatinous and farinaceous broths, immersion in the cold bath, especially the sea, the moderate use of wine*, gentle exercise, and the breathing a pure and temperate air are attended with peculiar advantage. Of the external applications, those which are of a sedative and corroborant nature are highly useful, but particularly the *aromatic-spirituous vapour*. The method of using it is by putting two ounces of boiling water, and two drams of the *volatile aromatic spirit* †, into a vessel capable of holding

* Hippocrates says: oculorum dolores meri potio, aut balneum, aut fomentum, aut venæsectio, aut medicamentum purgans exhibitum solvit. Aph. 31. sect. vi., aph. 46. sect. vii. Celsus has given the true sense of this aphorism in the following words: solet enim evenire nonnunquam, sive tempestatum vitio sive corporis, ut pluribus diebus neque dolor, neque inflammatio, et minime pituitæ cursus finiatur. Quod ubi incidit, jamque ipsa vetustate res matura est, ab iis eisdem auxilium petendum est, id est balneo, ac vino. Hæc enim, ut in recentibus malis aliena sunt, quia concitare ea possunt, et accendere: sic in veteribus, quæ nullis aliis auxiliis cesserunt, admodum efficacia esse consueverunt. Lib. VII. cap. vi. art. 8.

† Rec. Essentiæ limonum.
Ol. nucis moschatæ essentialis. an. drachmas duas.
Ol. caryophyllorum aromat. essentialis drachmam dimidiam.
Spiritus salis ammoniaci dulcis libras duas.
Distilla igne lenissimo.

In some instances of weakness of sight from extreme sensibility, cold applications to the eyes, or even the washing them with cold water, is injurious. On the contrary, warm applications repeated several times a day, as for instance the decoction of cha-

three ounces, then wrapping the vessel in a hot cloth, and conducting the vapour to the eye by means of a small funnel, or by merely applying the vessel itself close to it. This should be repeated three or four times a day, for at least half an hour, and the eyelids and eyebrow gently rubbed with the *volatile aromatic spirit.*

The patient should be cautious, both during and after the treatment, not to fatigue his eyes, and should desist from looking as soon as he feels the smallest uneasiness or sense of heat in them. In reading or writing he should place himself in such a manner as to have uniformly the same degree of light; too strong or too weak a light in these cases being equally injurious. When the patient has once accustomed himself to the use of spectacles, he ought never to attempt to read or write, or to look at minute objects without them.

When the *chronic* ophthalmia is the consequence of some other disease of the eye, it is evident that the plan of treatment ought to be directed to remove the primary affection. Of these diseases, some have been already spoken of in the preceding chapters, and the rest will be detailed hereafter. I shall only add here what my observation and experience have taught me with respect to the treatment of the *chronic* ophthalmia, when connected with those diseases of the general constitution which are most frequent.

A fact which for its constancy merits the atten-

momile applied by means of a sponge, as hot as can be endured, are of advantage in these cases. The constant use of coloured glasses is hurtful. *See the end of the* 19*th Chap.*

tion of practitioners, is, that every *chronic* ophthalmia, whether scrofulous, variolous, morbillous, herpetic, or secondary venereal, invariably affects the internal membrane of the eyelids, more particularly their edges and the ciliary glands, before the conjunctiva, which covers the anterior hemisphere of the eye, while on the contrary the *acute* ophthalmia, from whatever cause it may be derived, constantly occupies in preference the conjunctiva of the eyeball.

As no specific has been yet discovered for the cure of scrofula, the treatment of the *chronic* ophthalmia, when connected with that affection of the general system, is exceedingly limited, and is rather confined to a knowledge of what aggravates this disease of the eyes, than of any means adapted to the radical cure of it. The *chronic* scrofulous ophthalmia is exasperated by whatever debilitates the patient: as the abstraction of blood, the frequent use of saline purgatives, termed antiphlogistic, food of difficult digestion, as hard, salted, smoked, or fat meats, raw vegetables, acid fruits; also intense study, a sedentary life, wet and marshy habitations, want of cleanliness, and frequent variations of temperature. On the contrary the disease is mitigated, as well as its effects upon the eyes diminished, by the use of detergents continued for some time, especially rhubarb, the tartarized kali conjoined with the tartarized antimony in small and divided doses, and if the eyes are not in a truly inflammatory and excessively irritable state, the internal use of tonics, particularly the cinchona in powder, decoction, or cold infusion; or the decoction of bark conjoined

with the volatile tincture of guaiacum*; the extract of hemlock with bark†, or an electuary, consisting of bark cinnabar of antimony, aud gum guaiacum‡. The antimonial æthiops, in doses of half a grain a day, afterwards of 2, 3, 4 to 20, taken for fifty days or more. The second water of quick lime with chicken broth, in doses of three ounces each, every morning fasting, and afterwards morning and evening for some months; constantly observing a proper regimen. Besides these, sea-bathing in the summer, and frictions with flan-

* Rec. Decoct. cinchon. unc. 9.
Aq. melis unc. 1.
A third part of this may be taken three times a day, to each dose of which 4 or 5 drops of the tincture of guaiacum may be added for a child 10 years of age.

† Among the internal remedies enumerated in the treatment of the scrofulous recurrent ophthalmia, those from which I have found the most advantage during the intervals of relapse in spring and autumn, are in children from 5 to 7 years of age, Rhubarb in the dose of 24 grains[1] every day for 5 weeks, and afterwards the bark with extract of cicuta in doses of a scruple, with half a grain of the extract, two or three times a day for the same length of time, gradually increasing the quantity of the latter to 6 grains a day.

‡ Rec. Cinchon. unc. II.
Cinab. antimon. unc. I.
Gumm. guaiac. unc. II.
Syr. cort. aurant. q. s. f. electuar.
Of which half a teaspoonful may be taken three times a day, by a child of 10 years old.

[1] The largeness of this dose is by no means adjusted by the difference between the Italian and English weights, the former being to the latter only as 24 to 20.—Trans.

nel, morning and evening, are attended with great advantage. It is proper to repeat that these tonic remedies ought only to be employed after the obstructions of the abdominal viscera have been removed, which experience proves to be the principal source of the scrofulous chronic ophthalmia. It is an invariable practical fact that in scrofulous children the ophthalmia only abates in proportion as the abdomen becomes less tumid.

And with respect to the external means, the scrofulous *chronic* ophthalmia is exasperated by emollient and relaxing applications, and by the patient being confined in a room perfectly dark. On the contrary, those which afford relief are slightly astringent collyria, as lotions consisting of a decoction of henbane (hyoscyamus niger) and the flowers of mallow boiled in milk, with the addition of a few drops of the aqua lithargyri acetati comp.; the Thebaïc Tincture of the *London Pharmacopœia;* ointments composed of tutty, Armenian bole, or aloes, in such proportion as not to cause too much irritation. It is also advantageous to take away from the patient's eyes, every kind of covering, except a piece of taffeta suspended from the forehead, and at a distance from them; to accustom him by insensible degrees to bear a moderately strong light, and to allow him to breathe a pure air, and to take exercise. In this manner the want of specific remedies is in some measure compensated by the disease being moderated, or at least rendered supportable.

I might here adduce a considerable number of

instances of patients confined for several months in a dark room, and abandoned as incurable, who have quickly recovered under the use of these remedies; but particularly I think from their having been very gradually accustomed to bear a greater degree of light. It is not unworthy of remark that the scrofulous diathesis very frequently disappears spontaneously at the age of puberty, when the body is completely developed; and when this fortunate change takes place in those who are affected with the *chronic* ophthalmia, the disease, as I have frequently had occasion to remark, disappears also at the same time* with the general affection of the system.

Not less difficult of cure is the *chronic* stage of the *acute* ophthalmia from a variolous metastasis to the eyes; or that which takes place in consequence of the small-pox, and not unfrequently some weeks after the falling off of the crusts. This disease passes through a severe inflammatory stage; and even after the most judicious employment of antiphlogistic remedies, resists the use of corroborant and astringent applications, which appear best adapted to it.

One of the most efficacious remedies in this disease is a seton in the neck †, kept open for several months. Afterwards, when the stomach and primæ

* This verifies the observation of Celsus in his preface to the 7th book. *Sicut in oculis quoque deprehendi potest, qui a medicis diu vexati sine his interdum sanescunt.*

† T. Hildanus Centur. I. observ. 41. exempl. ii. iii. Journal de Médecine de Paris, Février, 1789.

viæ have been cleared by the *opening powders* *, I have found it very useful to order the patient, supposing a child ten years old, to take morning and evening a pill, consisting of one grain of calomel, one of the golden sulphur of antimony, and four of the powder of cicuta. If the patient possesses exquisite local and general sensibility, besides this remedy, I have found it advantageous to employ a mixture composed of three drams of Huxam's antimonial wine, and half a dram of the Thebaïc Tincture; five or six drops of which taken in any convenient vehicle twice a day, is a sufficient dose for a child of that age; and as an external application the *aromatic spirituous vapour*, in the manner before recommended. Where, however, there is no increased local sensibility, it may be sufficient to immerse the eyes frequently in distilled plantain water, with a little cerussa acetata, or camphorated spirit of wine added to it; to apply the white of an egg with a little sugar; the Thebaïc Tincture of the *London Pharmacopœia;* or Janin's ophthalmic ointment, observing in every other respect the rules already laid down, not to keep the patient's eyes covered with bandages, nor to confine him for too long a time in a dark room. The same treatment is proper in cases of *chronic* ophthalmia, in consequence of the measles.

* Rec. Cryst. tar. pulver. unciam dimidiam.
Antimon. tartariz. granum unum.
Misce, et divide in sex partes æquales.
One of these taken twice a day will be sufficient for a child of ten years old.

The venereal *chronic* ophthalmia is, strictly speaking, only a symptom of the confirmed lues. This disease is peculiar, inasmuch as it does not make its appearance with manifest symptoms of inflammation, but comes on insidiously, slowly, and without much uneasiness. It afterwards produces a gradual relaxation of the vessels of the conjunctiva, and internal membrane of the palpebræ, perverts the secretion of the ciliary glands; causes an ulceration of the edges of the eyelids by which the hairs fall off, and finally renders the cornea opake. In its highest degree, it excites a pruritus in the eyes, which increases particularly towards the evening, and during the night, and diminishes on the approach of morn, in the same manner as almost all the other secondary symptoms of lues venerea; lastly, it never arrives at the state of *chemosis* *.

As the inflammatory stage of this species of ophthalmia is so slight as to pass unnoticed, it is never necessary to employ the antiphlogistic plan of treatment. The same means, therefore, which are adopted in the cure of the lues venerea, may, in general, be employed in this case, without the smallest delay; that is, general mercurial frictions, and at the same time a strong saturated decoction of *mezereon* bark and sarsaparilla †. The ptisan of

* See note, p. 165.

† Rec Cort. rad. mezereon drachmam unam et semis.
Rad. sarsaparill. unc. I.
Coque in aq. font. lib. III. ad reman. lib. II.
adde
Lactis vaccini recentis unc. VI.
To be taken in small doses in the course of twenty-four hours.

POLLINI * is also useful, especially after mercury has been employed without advantage. A few drops of the collyrium before-mentioned, consisting of a grain of the hydrargyrus muriatus dissolved in six or eight ounces of mallow, or distilled plantain water, with the addition of a little mucilage of the seeds of psyllium, may be introduced between the eyelids every two hours, and at night Janin's ophthalmic ointment, not omitting the use of the *Tinctura Thebaica*. Cullen recommended, in this particular case, the *unguentum citrinum* of the *Edinburgh Pharmacopœia*, lowered with a double or triple quantity of lard; but I have found, that the same advantages are obtained from the ointment before-mentioned. If much circumspection in the use of mercury be required in any case of complicated lues venerea, it is certainly in that of which I am now treating. For if it be administered in too large doses, the violent shock which it gives to the head, never fails to aggravate the ophthalmia, and accelerate the total loss of sight. If, therefore, such an effect should take place, the use of mercury ought to be suspended for some time, the patient should be gently purged, his skin should be washed, and he should be removed into another apartment.

Lastly, it is proper to remark, that although the disease with which the *chronic* ophthalmia is con-

* An antivenereal nostrum in great repute on the continent, said to be a strong decoction of sarsaparilla.—See *Dissertazione sull 'uso della salsapariglia ne' mali venerei per* MONTEGGIA. MILANO, 1806.—TRANS.

nected be removed, and no traces of the latter remain upon any part of the conjunctiva which invests the eyeball, nevertheless, the edges of the eyelids very frequently continue slightly eroded here and there by small ulcers; which, in order that they may heal perfectly, require to be frequently touched with the argentum nitratum, covering the eschar immediately afterwards with a little oil.

In some particular cases, and especially in consequence of the *crusta lactea*, these small ulcers are situated around the root or bulb of the hairs, as in the *tinea capitis*. In order to apply the caustic to these ulcers accurately, and to draw it with precision along the edge of the eyelid, it is previously necessary to pluck out the hairs with the greatest possible care one by one, in the same manner as in the treatment of the *tinea capitis*. This being done, and the part fomented for some days, in order to obviate the effects occasioned by the irritation of plucking out the hairs, and to promote the suppuration of some small pustules which appear upon the edge of the eyelids, in consequence of this operation, the argentum nitratum should be drawn once or twice along the tarsus, and the eschar covered with a pencil stroke of oil. After the exfoliation of the eschar, it will be sufficient to anoint the edge of the eyelids for some nights with the unguent. hydrarg. nitrat. or the ophthalmic ointment of Janin, in order that the whole series of small ulcers occupying the roots of the hairs may be speedily healed. It is proper to observe, that the hairs which are pluck-

ed out, are reproduced, but not those which fall off spontaneously in consequence of the disease itself*.

* See on this subject the memoir of the surgeon oculist Buzzi, inserted in No. X. of the Mem. de Medic. of Dr. Giannini. The author considers the evulsion of the hairs as the principal object in the treatment of the *tinea* of the eyelids, and says, that the ulcers may be readily healed by introducing three or four grains of the *unguentum cerussæ*, between the eyelids, at bed-time, for five or six times, so as to penetrate underneath them. If, after some months, he adds, there be any appearance of the *tinea* attacking only some of the new cilia, the affected hairs should be carefully extirpated, in order to prevent the disease from being propagated to the others, and occasioning a complete relapse.

CHAP. VIII.

OF THE NEBULA (SUPERFICIAL SPECK) OF THE CORNEA.

One of the ill consequences of the obstinate *chronic* ophthalmia is the *nebula* of the cornea. I have chosen to call the disease of which I am now treating by this name, in order to distinguish it accurately from the *albugo* and *leucoma*, or from that dense spot of the cornea which is seldom attended with ophthalmia, and is sometimes almost callous, coriaceous, and of the colour of pearl; which affects the substance of the cornea, and consists in a thickening of the intimate texture of that membrane from the stagnation of gluten, or which is formed by a cicatrix in consequence of an ulcer or wound of the cornea *, attended with loss of substance. The *nebula*, of which I am about to treat, differs from the dense and dark spot forming the *albugo* or *leucoma*, inasmuch as it is only a recent, slight, and superficial opacity † of the cornea, preceded and accompanied by *chronic* ophthalmia, through which the iris and pupil are perceptible, and which does not therefore entirely take away from the patient the power of seeing, but only

* Avicenna, lib. iii. tract. 2. cap. 4. Scias quod albugo in oculo alia est subtilis, proveniens in superficie apparente, et nominatur *nebula;* et alia est grossa, et nominatur *albugo* absolute.

† Plate II. fig. 5. a.

causes the surrounding objects to be seen as if covered with a veil or cloud.

This disease is a consequence, as I have said, of the *chronic* ophthalmia, which has been long neglected, or improperly treated, in persons of a lax fibre, and whose eyes are weak and easily fatigued. The veins of the conjunctiva, which is greatly relaxed in this stage of the ophthalmia, yielding every day more and more to the blood which is retarded in them, become gradually more turgid and elevated than natural, assume an irregular and knotty appearance, first in their trunks, then in their branches at the junction of the cornea with the sclerotic coat, and ultimately in their minute ramifications, which are distributed upon the fine lamina of the conjunctiva; covering the external surface of the cornea. Whether a similar dilatation takes place also in the minute ramifications of the arteries corresponding to these veins, it is not an easy matter to determine. But it may be affirmed as certain, that the return of blood through the veins of the conjunctiva, which have become varicose, is greatly retarded by their flaccidity, their knotty and tortuous course, as well as by the folds which the relaxed conjunctiva forms in the different motions of the eyeball.

The minute ramifications of these veins upon the cornea are fortunately the last to become varicose, not only on account of their small diameter at their origin upon the lamina of the conjunctiva which externally covers it, but because the latter, being closely united to the cornea, confines and prevents them from being so easily distended by the ob-

structed blood, as where they are situated upon the white of the eye, and where the conjunctiva is naturally very distensile, and loosely connected to the anterior hemisphere of the eyeball. Hence it is, that although what are strictly called the trunks of the veins of the conjunctiva, are, in all cases of long continued *chronic* ophthalmia, dilated, varicose, and knotty, this is not so with the minute ramifications of these vessels upon the fine lamina of the conjunctiva covering the cornea externally; which only happens in those cases where the relaxation of the conjunctiva, including that portion of it which passes over the cornea, and the flaccidity of its veins approaches to the highest degree.

How considerable the resistance is, which the lamina of the conjunctiva almost inseparably united to the surface of the cornea, offers to the preternatural dilatation of these venous ramifications, may be inferred from cases of violent inflammation, particularly of *chemosis*, in which, in a very considerable number of instances, the cornea preserves its transparency, although the trunks of the veins of the conjunctiva, which are extremely turgid and wound together upon the white of the eye, are raised in a mass above the level of the cornea, without the blood forcing the boundary between the cornea and the sclerotica.

In cases, however, where not only the trunks and branches of the veins distributed upon the white of the eye, but also their very minute ramifications upon the cornea have become preternaturally dilated, some small reddish lines begin to ap-

pear upon that part of its surface, around which, shortly afterwards, a thin, milky, or albuminous humor is diffused, which destroys its transparency in that part. The thin, whitish, superficial spot, which is thereby produced, is precisely that to which I have given the name of *nebula* of the cornea. And as this sometimes takes place in one part only, at other times in several parts of the circumference of the cornea, consequently the disease is in some cases solitary, in others it is produced by a number of opake points distinct from each other; but which, collectively, darken the cornea either partially or entirely.

The opacity of the cornea, which is sometimes formed in the inflammatory stage of the violent *acute* ophthalmia, differs essentially from that which constitutes the *nebula*. In the first case there is an effusion of coagulable lymph from the extremities of the arteries into the intimate cavernous texture of the cornea, which tends to thicken and subvert its structure; or else an inflammatory pustule is formed in it, which afterwards suppurates and produces an ulcer: the *nebula*, on the contrary, is formed slowly upon the external surface of the cornea, in the long protracted *chronic* stage of the ophthalmia; is preceded by a varicose state of the trunks of the veins distributed upon the conjunctiva of the white of the eye, and afterwards by a dilatation of their minute ramifications situate upon the surface of the cornea; and, lastly, by an effusion of transparent or albuminous serum, into the texture of the fine lamina

of the conjunctiva, investing its external surface, but which never causes any external elevation in the form of a pustule.

In whatever part of the cornea, therefore, the *nebula* is situated, there is always a fasciculus of varicose veins* corresponding to it upon the white of the eye, more elevated and knotty than the rest of the blood-vessels of the same order. And if the cornea is cloudy in several points of its circumference, there are so many distinct fasciculi of varicose veins, projecting upon the white of the eye, which exactly correspond to the different opake points formed upon it. One would say, at first sight, that in each of these fasciculi of veins, which are so prominent and distinct from the others, the blood had forced itself a passage from the border of the sclerotic coat upon the cornea. I have a preparation of an eye taken from the body of a man affected with *chronic* varicose ophthalmia and *nebula* of the cornea, who died from an inflammation of the chest. After having injected the head by the arteries and veins, I found that the wax with which the veins of the conjunctiva were completely filled, had not only passed freely into the most elevated fasciculus of these veins, but into its minute ramifications distributed upon the surface of the cornea, at the part precisely corresponding to the *nebula*; while in all the rest of the circumference of the cornea the injection had stopped, from its having met with an insuperable obstruction. In this eye it is astonishing to see, by the help of a glass, the exceedingly

* Plate II. fig. 5. b.

fine net-work which the numerous small branches of veins form at the termination of the sclerotic coat, where they elegantly anastomose in endless variety, without any of them, except those corresponding to the *nebula*, surpassing the boundary formed by the strong adhesion of the lamina of the conjunctiva at the part where it advances to cover the external surface of the cornea.

The *nebula* of the cornea demands from its commencement the most effectual method of treatment; for although at first it occupies only a small part of the circumference of the cornea, yet when left to itself it proceeds towards the centre of it, and the minute branches of the dilated veins, which ramify upon it, augmenting in number and extent, ultimately cause the delicate lamina of the conjunctiva to degenerate into a dense and opake membrane, which greatly obstructs the vision, or tends to destroy it altogether.

The indication of treatment in this disease consists in causing the varicose vessels of the conjunctiva to contract, so as to recover their natural dimensions; and if this should not succeed, in destroying the communication between the trunks of these vessels, and their minute branches which are distributed upon that part of the surface of the cornea where the *nebula* is situate. The former of these indications may be fulfilled by means of the astringent and corroborant applications mentioned in the preceding chapter, particularly the ophthalmic ointment of Janin, provided the disease be incipient, and of small extent. But when it has advanced near to the centre of the cornea, and the relaxation

of the conjunctiva and its vessels is very considerable, the most speedy and effectual method of treatment which has been hitherto proposed, is that of extirpating the fasciculus of varicose veins* near their origin, that is, close to the *nebula* of the cornea. By means of this excision, the blood retarded in the dilated ramifications of the veins upon the surface of the cornea, is immediately discharged; the varicose vessels are enabled to recover their natural tone and dimensions; and a sort of drain is opened at the part where the cornea and sclerotic coat unite, by which the serous or albuminous fluid effused into the texture of the lamina of the conjunctiva spread upon the cornea, or into the cellular tissue which connects these two membranes together, is gradually discharged. The rapidity with which the *nebula* of the cornea is dissipated by means of this operation, is truly surprising, the dimness in that part of the cornea where it is situated generally disappearing in the course of twenty-four hours.

The extent of the excision in these cases must be determined by the size of the speck upon the cornea, and by the number of fasciculi of varicose and knotty veins, more elevated and distinct than the others which proceed from the opake part; so that if the *nebula* is of moderate extent, and there is only one fasciculus of varicose vessels † corresponding to it, the extirpation of that alone will be sufficient. If, however, there are several opake points upon the cornea, and consequently several

* Plate II. fig. 5. b. † Plate II. fig. 5. b.

fasciculi of varicose veins, forming a circle at different distances from each other upon the circumference of the white of the eye, the surgeon ought to remove the whole circle of the conjunctiva at the part where the cornea and sclerotic coat unite, as in this manner he will be certain of including the whole of the varicose vessels. It should be observed, however, that the mere division of the vascular fasciculus does not fulfil the indication of permanently destroying the direct communication between the trunks of the vessels and their minute ramifications upon the cornea. For when an incision is made, for instance, with the back of a lancet, it is true that both portions of the divided vessel separate in a contrary direction, and leave an evident space between them; but it is equally certain that a few days afterwards the mouths of these vessels approach and inosculate, so as to recover their former continuity. In order, therefore, to derive the greatest possible advantage from this operation, it is requisite to remove a small portion of the fasciculus of varicose veins, together with an equal portion of the conjunctiva upon which it is situated.

In order to perform this operation in the most expeditious manner, and with as little inconvenience to the patient as possible, setting aside the usual method of passing a needle and thread through the fasciculus of varicose vessels, an operation which is tedious, embarrassing, and unnecessary, an able assistant should hold the patient's head against his breast, and at the same time separate the eyelids; the surgeon then taking hold of the fasciculus of vessels with a fine pair of forceps, close to the mar-

gin of the cornea, and raising it a little, which, from the flaccid state of the conjunctiva, it readily admits of, should remove it by means of the small curved scissors, together with a small portion of the conjunctiva, making the section of a semilunar figure, and as much as possible concentric and close to the circle of the cornea. If, however, the case require that more than one fasciculus of vessels should be removed, and that these are placed at some distance from each other, the surgeon should raise them expeditiously, one after another, and extirpate them in succession; or if they are situated near to each other, and occupy the whole circumference of the eye, the excision should be carried completely round, following the edge of the cornea, and thus including, together with the conjunctiva, the whole of the varicose vessels.

The divided vessels should be allowed to bleed freely, and their discharge even promoted by applying a sponge dipped in warm water upon the eyelids, with which they should be fomented until the blood cease to flow of itself; the eye should then be covered with a linen cloth and bandage, and ought not to be opened until twenty-four hours after the operation, when the *nebula* will be found either to have disappeared entirely, or to be so much diminished that the cornea may be said to have recovered its former transparency.

During the succeeding days the patient should be directed to keep his eye closed and covered with a piece of soft rag and bandage, and to wash it three or four times a day with a little warm mallow water.

When the inflammation takes place upon the conjunctiva covering the white of the eye, which usually happens on the second or third day from the operation, it is curious to observe, particularly in cases where it has been divided circularly, that while the greater circumference of the eyeball becomes red, a small whitish circle at the divided part forms a boundary, which prevents the redness of the conjunctiva from extending to the cornea. By the use of internal antiphlogistic remedies and emollient applications, this inflammatory state of the conjunctiva subsides in a few days, and that part of the conjunctiva which had been divided appears covered with a layer of mucus. From this period the wound gradually contracts, until it is completely healed. A lotion of mallow water, used at first warm, and afterwards cold, is the only local remedy which it is necessary to employ in these cases; as every kind of collyrium or stimulating ointment retards the cure.

When the wound is healed, it will not only be found that the cornea has recovered its transparency, but also, especially when the excision has been carried completely round the eye, that the preternatural flaccidity of the conjunctiva has considerably diminished or entirely disappeared; for after a portion of this membrane has been removed in a direction concentric to the margin of the cornea, the cicatrix by its closing, draws the conjunctiva forwards, and as it were stretches it upon the eyeball. If, however, the conjunctiva covering the white of the eye should remain afterwards a little

[illegible] flabby than natural, yellowish, and marked here and there with veins which threaten to become varicose, astringent and corroborant applications may be employed with advantage, and the ophthalmic ointment of Janin in the manner recommended in the preceding chapter on the subject of *chronic ophthalmia.*

CASE XXVII.

Clara Bellinzoni, of Belgiojoso, a robust woman, 38 years of age, subject from her infancy to cutaneous eruptions, especially in the spring, was attacked some years ago with a redness of the right eye, which extended from the internal angle towards the cornea, and resisted every kind of application. In the course of three years, this redness, which evidently depended upon a fasciculus of varicose veins of the conjunctiva, extended so far upon the surface of the cornea as ultimately to render it opake to a certain extent, and to occupy even more than two-thirds of the pupil. Independently of the patient's indistinct vision, the continual sense of burning in the eye, occasioned by the disease, and particularly the fear of losing the sight of it entirely, induced her to come into the hospital.

On the 3d of April 1797, while an assistant separated the eyelids, I took hold of the fasciculus of veins which extended in the direction of the internal angle of the eye towards the cornea upon the fine lamina of the conjunctiva which covers it; and collecting the whole of the fasciculus into one

fold, I raised it a little, and removed it with the curved scissors in the form of the letter C at the part where the cornea and sclerotic coat unite. I allowed the blood to flow, and even encouraged it, by applying a soft sponge upon the eyelids, squeezed out of warm water; and afterwards covered the whole with a compress and bandage.

On the following day, the eyelids were unusually tumid, red, and affected with erysipelas, which extended over the right side of the face, accompanied with feverishness, and greater heat of the whole body than natural; an affection to which the patient had been frequently subject for several years, but which she had never mentioned before.

I ordered her to observe a rigorous diet, and to take a pint of the decoction of the root of the triticum repens, with a grain of the antimonium tartarizatum, in divided doses, for several days; and upon the eyelids I applied bags of emollient herbs. The great tumefaction and tension of the eyelids prevented me from examining the state of the cornea.

On the 8th day from the operation the erysipelas terminated by a desquammation of the cuticle. The patient was now able to open her right eye freely, and I found, with much satisfaction, that the cornea was entirely clear, and that she could distinguish objects distinctly. The divided part suppurated kindly, no other application being employed, until the conjunctiva was perfectly healed, than a lotion of the aqua malvæ. When the wound

[illegible]led, I ordered the patient to use the vitriolic collyrium with a little spirit of wine several times a day, by means of which the conjunctiva recovered its former tone, and the cornea its perfect transparency. The woman was discharged from the hospital, perfectly cured, in the beginning of May, being little more than a month from the time of the operation.

CASE XXVIII.

Giovanni Bonfasani, of S. Lanfranco, 50 years of age, 15 years before the appearance of the disease of which I am about to speak, was afflicted with a violent *acute* ophthalmia in both eyes; on the disappearance of which there remained on the lower part of the cornea of the right eye, a small but dense and irremediable *albugo*. The left eye continued in a good state, but the conjunctiva of the right was constantly marked in several parts with small varicose vessels. One cluster of these vessels, more turgid and elevated than the rest, was situated towards the external angle, and in the course of some years extended upon the cornea, and produced in that part a *nebula* through which the patient could with difficulty distinguish objects; the other small vessels of the conjunctiva also threatened to become varicose, and occasioned a troublesome sense of smarting, and a perpetual weeping of the eye.

The operation before described was undertaken

the 8th of May, and the blood was encouraged to flow by fomenting the parts with warm water.

The day following I found the nebula almost entirely dissipated, the patient complained of a load at his stomach, and a bitter taste; I therefore ordered him to take, in small doses, a pint and a half of the decoction of the triticum repens, with a dram of the kali tartarizatum, and a grain of the antimonium tartarizatum, which procured some evacuations from the bowels, and relieved him.

The wound was healed in the course of 15 days, by merely washing the parts frequently with the aqua malvæ. I then ordered the patient to make use of the vitriolic collyrium with a little spirit of wine several times a day, which he continued to do for two weeks with great advantage, as the cornea entirely recovered its former transparency, except at the part occupied by the *albugo*; the patient, however, saw sufficiently well with this eye, and left the hospital 36 days after the operation, during which time it is proper to remark, he had only been confined to his bed for the first four days.

CASE XXIX.

Nunciata Raffa, of Genzone, 17 years of age, of a weakly constitution, irregular in her menstruation, and who had been formerly very subject to discharges from the eyes, was admitted into the hospital the 2d of January 1799, on account of a speck upon the cornea of the left eye, which for two months had occasioned some degree of

smarting, weeping of the eye, and dimness of sight.

The *nebula* occupied nearly two thirds of the cornea, and was evidently connected with a large and very elevated cluster of varicose vessels, extending from the external angle of the eye to the part upon which it was situated. One part of this superficial speck was more dense, white, and opake than all the rest. The fasciculus of varicose vessels was elevated with the forceps, and removed by means of the curved scissors, at the part where the cornea unites with the sclerotic coat, and the bleeding was encouraged by fomentations with warm water.

Twenty-four hours had scarcely elapsed, when on removing the first dressings, the *nebula* was found almost entirely dissipated. The eye was afterwards covered and washed frequently in the course of the day, with tepid mallow-water.

On the 3d day the wound began to suppurate, without any bad symptom taking place, and in the space of 14 days was healed. The vitriolic collyrium was employed for some weeks afterwards, which contributed to perfect the cure by completely restoring the transparency of the cornea, except the small part of it which had been always more dense and opake than the rest.

CASE XXX.

Giacopo Deamici, of Pavia, 32 years of age, by

trade a weaver, a thin and deformed man, was affected for several years with a chronic inflammation of the right eye, which terminated by almost entirely taking away the power of seeing on that side. When he came into the hospital, which was on the 2d of December 1794, his eye appeared to be in too hopeless a state to permit him to expect any particular benefit. The cornea of the right eye was completely cloudy, and marked in several places with deeply opake white points, the vessels of the conjunctiva were relaxed and varicose in the whole circumference of the eye, from whence they extended upon the cornea in the form of reddish lines.

The operation, however, was undertaken, and a portion of the flaccid conjunctiva was removed from the whole circumference of the eye, at the part where the cornea and sclerotica join. The blood flowed abundantly from the wound. The next day the cornea was found much less cloudy than before.

From the 4th of December to the 29th the patient used no other external application than a lotion of mallow-water; the eye was defended from the contact of the air and light, by means of a piece of linen cloth, and he remained out of bed, as in a state of convalescence.

At this period the wound was completely healed, and the cornea had almost entirely recovered its transparency, except that there remained upon it two dense white spots, neither of which was larger than the point of a needle. The patient used the

collyrium vitriolicum for some time with advantage, and was then dismissed from the hospital.

CASE XXXI.

Domenico Robola, aged 40, a shoemaker of Pavia, excessively addicted to wine, was admitted into the hospital on the 22d of May 1795, on account of a chronic ophthalmia in both his eyes, which had rendered him completely incapable of following his business.

The disease began six years before, by an itching and redness in the eyes, with tumefaction and pustules upon the edges of the eyelids; and from that indolence which is very common among this class of persons, especially those addicted to drinking, he neglected his disease until his sight was almost entirely destroyed. The conjunctiva on both sides was very much relaxed, and the blood-vessels in every part of the circumference of the eye were varicose and turgid, and passed every where beyond the border of the cornea, evidently extending for some way upon the fine lamina of the conjunctiva which covers it. The cornea also was completely cloudy; the eyelids tumefied, and the ciliary glands more enlarged than usual.

The circular excision of the conjunctiva was performed upon both eyes, an operation, which, in these cases, is easily executed, in as much as the relaxed state of the conjunctiva readily admits of its being laid hold of with the forceps, and elevated in the form of a fold around the whole

of the border of the cornea. The blood was encouraged to flow, at first by fomentations of warm water, afterwards by the application of bags of emollient herbs.

The following day I found the cornea of both eyes very much brighter. Two days after, the patient complained of nausea, and a bitter taste in his mouth. I therefore ordered him a pint of the decoction of the root of the triticum repens with two drams of the crystals of tartar, and one grain of tartarized antimony, in small doses, which was repeated the two following days with advantage.

The mucous suppuration upon the white circle left by the excision of the conjunctiva, did not appear until the 8th day after the operation. By employing only a lotion of mallow-water, and keeping the eyes covered by a piece of linen suspended from the forehead, the wound healed in the course of 22 days more. I then began the use of the ophthalmic ointment of Janin morning and evening, and the camphorated vitriolic collyrium during the day. In two weeks more the cornea of both eyes, but especially that of the left, was so much amended that the man could see distinctly even the smallest objects, and was now able to return to his former occupation.

CASE XXXII.

A mendicant, 50 years of age, was admitted into the hospital on the 12th of April 1796, with

the cornea of the right eye completely darkened by a *nebula*, in consequence of an obstinate chronic inflammation of the eye, which for two months had been exasperated by a cutaneous eruption upon the whole of the right side of the face. The whole of the cornea not only appeared superficially cloudy, but presented, a little above the centre of it, a point whiter and more opake than the rest. The blood-vessels of the conjunctiva appeared highly turgid, varicose, and relaxed, and were seen rising upon the cornea from every part of the circumference of the white of the eye. The edges of the eyelids were also tumefied, and the eye watery and gummed.

A small portion of the conjunctiva, and its vessels, were removed around the white of the eye, near the margin of the cornea. A considerable quantity of blood flowed, which greatly relieved the patient from the troublesome sense of burning which he had before complained of. Bags of emollient herbs were applied upon the eye.

The next day the cornea presented a degree of brightness which exceeded all expectation.

Three days after, an abundant discharge of mucus took place from the ciliary glands, and the divided part of the conjunctiva, which rendered it necessary to wash the eye frequently with mallow-water. The cornea acquired a greater degree of clearness; and, in order to divert more effectually the discharge from the eyelids, I ordered a seton to be made in the neck.

In three weeks more, the circular wound of the

conjunctiva was perfectly healed, and I was then able to employ the vitriolic collyrium, and the ophthalmic ointment of Janin; which perfected the cure by removing the morbid state of the ciliary glands, and strengthening the conjunctiva. The white opake spot, which was situated a little above the centre of the cornea, remained unaltered, but did not greatly obstruct the sight.

CHAP. IX.

OF THE ALBUGO AND LEUCOMA.

THE *albugo* and *leucoma*, as I have hinted in the preceding chapter, are essentially different from the *nebula* of the cornea, in as much as the former are not produced by a slow chronic inflammation, attended with a varicose state of the veins, and an effusion of thin, lacteous serum into the texture of the fine lamina of the conjunctiva, covering the cornea; but are the effect of the violent *acute* inflammatory ophthalmia, in consequence of which a dense coagulable lymph is poured out from the extremities of the arteries, sometimes superficially, at other times more deeply into the substance of the cornea: or else the disease consists in a firm, callous cicatrix of the cornea, produced by an ulcer or wound, accompanied with loss of substance. The term *albugo* more properly belongs to the first of these, that of *leucoma* to the latter, especially if the cicatrix or dense coriaceous spot occupy the whole or greater part of the cornea.

The recent *albugo*, produced by the violent *acute* inflammation of the eye, and left upon the

cornea after that affection has been dissipated by the use of general remedies and emollient applications, is of a clear milky colour; but when inveterate it acquires the colour of white cretaceous earth, or pearl. Of those which are inveterate, some appear to have no further dependence on the vascular system of the cornea; since they remain insulated in the middle of the transparent part of that membrane, without occasioning any smarting or sense of uneasiness, without having any connection with the vessels of the conjunctiva, without the rest of the eyeball appearing in any degree diseased, and without nature attempting any dissolution of it by absorption.

The recent *albugo*, provided the coagulable lymph, extravasated by the action of the extremities of the inflamed arteries, has not disorganized the intimate structure of the cornea, is most frequently dissipated by the same means which are employed in the treatment of the first and second stage of the violent *acute* ophthalmia; that is, in the first stage, by general and local bleeding, by internal antiphlogistic remedies, and emollient applications; and in the second stage, by astringent applications of a gently irritating and corroborant nature. For if, after the inflammatory stage has terminated, the action of the vascular absorbent system of the cornea is excited and restored, by means of these local remedies, the coagulable lymph stagnating in that membrane, and forming the *albugo*, is absorbed, and the cornea recovers its former transparency. The cornea has a considera-

ble affinity to parts of a ligamentous structure. Like ligament it is endowed with little vitality, is not furnished with red vessels, and only appears to be exquisitely sensible when it is inflamed. The inflammation of the cornea, as that of ligamentous parts possessing little vitality, is slowly resolved, and therefore readily leaves behind it a portion of coagulable lymph, which, during the inflammatory stage, is effused into its substance, and produces opacity; this is not necessarily removed in any other manner, after the inflammation disappears, than by absorption, which can only be promoted by means of stimulant applications.

But although this is frequently obtained in the recent *albugo*, it is not so easily effected, when, from the long continuance of the disease, the action of the absorbent system of the cornea, in the affected part, has become torpid: or when the intimate texture of the cornea has been disorganized by an extravasation of dense and tenacious lymph from the extremities of the arteries. For whether the humor forming the albugo be absorbed or not, the injury which has been done to the internal structure of the cornea in this part renders it permanently opake.

There is another species of *albugo*, arising from chronic *varicose* opthalmia, in which not only the blood vessels on the lamina of the conjunctiva covering the cornea are preternaturally dilated; but those also which enter into the texture of the cornea itself. In this highest degree of the disease in which blood rather than coagulable lymph

is effused into the intimate spongy texture of the cornea, if the larger varicose vessels of the conjunctiva on the border of the cornea with the sclerotica are extirpated, their minute ramifications on the cornea are certainly also for the moment unloaded; but they shortly afterwards reappear as turgid as before, from their communication with other minute branches deeply seated in the substance of it. As a proof of this, if punctures are made in different parts of the cornea, blood will flow from each of them as from a sponge. This species of *albugo* in consequence of the highly varicose state of the superficial and deep vessels of the conjunctiva and cornea, resists all the means hitherto proposed for re-establishing the transparency of the cornea, and renders the excision of the varicose trunks, or the use of astringent and corroborant applications ineffectual.

The circumstances, therefore, which are most favourable to the cure of the albugo, are, the disease being recent, without disorganization of the texture of the cornea, or of the lamina of the conjunctiva covering it, and its taking place in subjects of an early age, or if a healthy constitution in whom the lymphatic system is most active, and in whom its action is more capable of being excited by external stimuli. I have seen innumerable instances in young children, where, in consequence of the violent *acute* ophthalmia, the specks or albugines, which have remained insulated in the middle of the transparent part of the cornea, after the disappearance of the ophthalmia, have vanished insensibly in the course of some months,

and sometimes spontaneously, contrary to all expectation. Heister *, Langguth †, and Richter ‡, have made the same observation. This phænomenon, certainly, can only be attributed to the vigorous action of the absorbent system in children, and to the intimate texture of the cornea, in such cases, not being disorganized at the part where the effusion of coagulable lymph has taken place.

Of the local remedies which are calculated to promote absorption, whether in the recent *albugo*, where the inflammation has ceased, or in that which is inveterate, those from which I have found the greatest advantage, are, the sapphirine collyrium §, the ointment consisting of tutty, aloes, calomel, and fresh butter ||, that of Janin, the gall of the ox, sheep, pike, and barbel, applied upon the cornea, by means of a small hair pencil, two or three times a day, provided it does not cause too much irritation. The ox and sheep's gall is more stimulating than that of fish ¶. In some cases

* Institut. chirurg. tom. i. cap. 58.

† Dissert. de oculorum integritate improvidæ puerorum ætati sollicite custodienda. § xxi.

‡ Elem. di chirurg. tom. iii. cap. 4.

§ This is a solution of 2 scruples of sal ammoniacus, and 4 grains of ærugo in 8 ounces of aqua calcis, allowed to stand for 24 hours, and then filtered.

|| Rec. Tutiæ s. p. drachmam I.
Aloes s. p.
Calomelan. ana gr. duo.
Butyr. recent. unc. semis. M. f. unguent.

¶ Stimulant applications have been advantageously employed in the treatment of the albugo for more than 2,500 years, but it was not until the present time that the rational principles of this

where the eyes were so irritable as not to bear the action of these remedies, I have employed with advantage the oil of walnuts a little rancid, directing two or three drops of it to be instilled into the eye every two hours, and continued for some months. In others I have found the juice of the lesser centaury with honey useful, or a liniment made with 2 drams of the oil of walnuts, half a dram of ox-gall, and 2 grains of carbonate of ammonia.

In general, however unfavourable the case may appear, it is proper to persist in the use of such local and general remedies as are judged most appropriate to the nature of the case, and particular sensibility of the patient's eye, with the utmost diligence, for at least three or four months before it is given over as hopeless, and the patient declared incurable.

All the expedients which have been hitherto proposed for the cure of the inveterate coriaceous *albugo*, or rather *leucoma*, or of that which is the consequence of a cicatrix, and which consist in the scraping of the laminæ of the cornea, the perforation of it, or the formation of an artificial ulcer upon a portion of the leucoma, are methods entirely useless, invented by those who are ignorant of the structure of the parts interested in the disease, and extolled by empiricism. For whether the thickness of the cornea be diminished by means of scraping, or by cutting it with an instrument,

mode of treatment were understood. These have been deduced from the correct notions which we have at present concerning the action of the sanguineous and absorbent systems in a state of health and disease.

such method cannot in any manner restore to that membrane the transparency which it has lost; and if, even immediately after the operation, a small degree of light should be admitted into the eye, this advantage would be only momentary; since the ulcer produced by the operation on healing and becoming callous again, would leave the cornea in its former state of opacity. The artificial ulcer also excited on the *leucoma* would be useless, if the disease merely depended on a stagnation of dense lymph; but the fact shews the contrary, and proves that the disorder, when not produced by a cicatrix, is not only formed by a condensed humor, but by a disorganization of the intimate texture of the cornea, in which consists, as I before stated, the difference between the *albugo* and the *leucoma*.

CHAP. X.

OF THE ULCER OF THE CORNEA.

The ulcer of the cornea is a very frequent consequence of the bursting of a small abscess, which not unfrequently forms under the fine lamina of the conjunctiva, which covers it, or in the substance of the cornea itself, in cases of violent *acute* ophthalmia. And it is worthy of observation that the conjunctiva very seldom becomes ulcerated, except in those parts where it is tense; that is, on the edges of the eyelids, at the borders of the cornea, or upon the surface of the cornea itself. At other times the ulcer of the cornea is produced by the contact of corroding, cutting, or pricking substances, insinuated into the eyes, as quick lime, particles of glass or iron, thorns, or other similar matters, capable of producing a solution of continuity.

The small abscess of the cornea is accompanied with the same symptoms as the violent inflammatory ophthalmia, particularly a troublesome sense of tension in the eye, eyebrow, and neck; a burning heat, copious discharge of tears, aversion to the light, and an intense redness of the conjunctiva, especially opposite and near the seat of the abscess.

This small inflammatory pustule, in comparison with those which form upon other parts of the body, is in general very slow in bursting after it has suppurated. Experience, however, has proved, that it is improper to open it with the point of a lancet or other instrument, in order to procure a discharge of the matter contained in it, as is practised by the generality of surgeons; for although the abscess seem to have arrived at its highest degree of maturity, the matter which it contains is so tenacious and rooted, as it were, in the substance of the cornea, that no part of it is discharged by the artificial aperture, and the orifice, on the contrary, which is made, rather aggravates the disease, increases the opacity of the cornea, and frequently occasions the formation of another abscess in the vicinity of the first. In such cases the most certain method is to wait until it opens externally of itself, promoting its rupture by frequently fomenting and washing the eye with tepid mallow-water, and by the application of bags of emollient herbs.

The spontaneous rupture of the small abscess of the cornea, is most frequently announced by a sudden increase of all the symptoms of ophthalmia, particularly by an intolerable sense of burning in that part of the cornea where the abscess was seated, which is augmented by the patient's moving the affected eyeball, or even the eyelids. This circumstance, however, is rendered evident by an excavation which may be observed in the part of the cornea where the whitish pustule was situated,

and which may be still more distinctly seen by examining the eye sideways.

The introduction of extraneous bodies into the eye, which have simply divided a part of the cornea, or are fixed in it, provided they are immediately withdrawn, do not in general excite ulceration, the injured part being consolidated by the first intention. Those which abrade or burn the surface of this membrane, or which being fixed in it, are not immediately removed, occasion the *acute* ophthalmia, afterwards a suppuration round the injured part, and lastly an ulcer.

The ulcer of the cornea has this in common with ulcerous solutions of continuity of the skin, where this integument is fine, tense, and possessed of exquisite sensibility; that on its first appearance it assumes a livid and cineritious colour; its circumference is red, its margin is tumid and irregular, it is exquisitely painful, discharges an acrid serum instead of pus, and has a tendency to spread and become rapidly deeper. Such is precisely the character of the ulcer of the cornea, and of those of the nipples, glans penis, lips, of the tip of the tongue, which are called aphthæ, of the tarsi, of the entrance of the auditory canal, and of the nostrils, and other parts, where the thin, tense and very sensible skin is reflected inwards.

Ulcers of this class, when left to themselves, or improperly treated, spread rapidly, become deep, and destroy the parts which they occupy; if that of the cornea extend superficially, it speedily destroys the transparency of this membrane, and

if it spread deeply in the form of a small tube, and penetrate into the anterior chamber of the aqueous humor, it occasions a discharge of this fluid, and afterwards a fistula of the cornea; if the aperture become larger, besides the discharge of the aqueous humor, it gives rise to another disease much more serious than the ulceration itself, the protrusion of a portion of the iris, the discharge of the crystalline and vitreous humors, and in short the total destruction of the organ of vision. This most serious accident is not unfrequently the consequence of the violent *acute* gonorrhœal ophthalmia, complicated with atony or defect of vitality in the cornea; in consequence of which this membrane is no longer sensible to the action of the internal and external remedies, directed to arrest the progress of the ulceration; which, notwithstanding the most efficacious measures, extends with the greatest rapidity over the cornea, until it has completely destroyed it.

It is therefore of the greatest importance, as soon as an ulcer appears upon the cornea, to arrest its progress instantly, as far as the nature of the disease permits; or so to change the morbid process, that instead of tending to the destruction of the cornea, it may be disposed to heal; and this should be aimed at the more solicitously, as the difficulty of converting this morbid process into a healthy one, increases in proportion to the extent and depth of the ulcer; and although the healing of a large ulcer should be speedily obtained, the injury which the vision receives, in consequence

of the extensive cicatrix resulting from it, is irreparable.

With regard to the treatment of the ulcer of the cornea, those writers who have taught that no external application can be employed with advantage, for the purpose of healing it, until the acute ophthalmia has been either entirely, or in a great measure subdued, appear to me to have fallen into a considerable error. Experience shews precisely the contrary, and teaches that the application of such local remedies as are capable of quickly removing or mitigating the increased morbid sensibility of the ulcer, and at the same time arresting its destructive progress, should be employed in the first instance, and afterwards those which are proper to remove the inflammation, provided it should not disappear of itself in proportion as the ulcer heals. It is a fact, established by certain and repeated observations, that the ulcer is the cause of the ophthalmia, and not the ophthalmia of the ulcer *. On the bursting of the abscess of the cornea, it is true, that the symptoms of the violent *acute* ophthalmia are exasperated; that the redness of the conjunctiva is increased, as well as the turgescency of its vessels; but it is equally certain that this arises only from an augmented determination of blood to it, occasioned by the increased sensibility of the ulcerated part of the cornea. On the contrary, in

* Except the case in which the ulcer appears in the highest degree of the violent *acute* ophthalmia; where the primary indication must be always that of abating the violence of the inflammation as quickly as possible, previously to the treatment of the ulcer.

proportion as this irritable state of the ulcer is allayed or diminished, the ophthalmia subsides, and on the ulcer becoming clean, and proceeding towards cicatrization, the inflammation is gradually resolved and disappears, or at most requires only for some days the use of an astringent and corroborant collyrium.

Similar examples come under our daily observation in ulcers of other parts besides the cornea, particularly in the small sordid sores before-mentioned, which take place upon the internal surface of the lips, the tip of the tongue, the nipples, and glans penis, which, on their first appearance, as I before said, are covered with an ash-coloured surface, excite inflammation in the surrounding parts, and occasion a sense of pricking, and a very troublesome burning heat; in order to remove the inflammation, we do nothing more than speedily allay the excessive irritability of these sores, and change the ulcerative process into that which conduces to their cicatrization; after which the surrounding inflammation is immediately dissipated, without the necessity of recurring to other remedies, which are peculiarly directed in the treatment of that disease.

The remedy, which in all these cases produces so speedy and good an effect, is the caustic. This immediately destroys the naked extremities of the nerves in the ulcerated part, and quickly takes off the morbid excess of sensibility; converts the pale surface of the ulcer and the acrid humor with which it is imbued, into a crust or eschar, which, in the same manner as the epidermis, moderates the con-

tact of the surrounding parts upon the ulcer, and finally changes its destructive process into that of granulation and cicatrization.

For the purpose of cauterizing the ulcer of the cornea, the caustic preferable to all others is the argentum nitratum. This should be cut in the form of a crayon pencil, with the point of which, the eyelids being well separated, and the upper one fixed by means of *Pellier's elevator**, the ulcer of the cornea should be touched, and the caustic held in contact with it a sufficient length of time to form an eschar. If any part of the caustic should be dissolved by the tears, it ought to be washed off by dropping a little milk into the eye.

During the application of the caustic, the patient complains of very acute pain, but this excessive uneasiness is amply compensated by the ease which is felt a few minutes afterwards. For the burning heat in the eye ceases, as if by a charm, the eyeball and eyelids can be moved without difficulty, the discharge of tears and turgescency of the vessels of the conjunctiva diminish, and the patient is able to support a moderate degree of light, and to take rest.

These advantages continue as long as the eschar adheres to the surface of the ulcer; but as soon as the exfoliation takes place, which is on the 2nd, 3rd, or 4th day, the former symptoms of the disease return, particularly the sense of pricking and burning in the ulcerated part of the cornea, the copious discharge of tears, the difficulty of moving

* Plate III. fig. 1.

the eyeball and eyelids, and the intolerance of light; but they are always in a less violent degree than before. On the re-appearance of these symptoms, the surgeon should apply the caustic again without delay, taking care to produce an eschar equally strong and adherent upon the whole surface of the ulcer, which will be succeeded by the same relief as before. And this should be repeated a third time, if necessary; that is, if on the exfoliation of the second eschar, the excessive sensibility of the ulcer is not sufficiently destroyed, and its corroding and destructive progress arrested. If things go on favourably, it will be constantly found, that after every exfoliation of the slough, the morbid sensibility of the eye is diminished, and the ulcer less extensive and deep than before, and that, instead of its former livid and ash-coloured appearance, it assumes a light flesh-colour, a certain indication that its destructive process is checked, and that it is disposed to heal. In proportion also as the ulcer diminishes, the turgescency of the vessels of the conjunctiva and the ophthalmia gradually subside.

At this period, when the process of *granulation* has commenced, the further application of the caustic, which has been hitherto so beneficial, would be improper, since, instead of accelerating the healing of the ulcer, it would, on the contrary, repress the granulations, re-produce the pain, inflammation, and weeping of the eye, and the ulcer would again assume a sloughy and cineritious aspect, and its edges become irre-

gular and tumefied. This fact has also been noticed by Platner*. *Necesse est*, says he, *ut hoc temperata manu, nec crebrius fiat, ne nova inflammatio, novaque lachryma his acrioribus concitetur.* As soon as the eye becomes easy and the process of granulation has commenced, whether after the first, second, or third cauterization, the surgeon ought entirely to desist from the further use of any powerful caustic, and confine himself to the application of the vitriolic collyrium; or that consisting of four grains of the vitriolated zinc, four ounces of plantain water, and half an ounce of the mucilage of quince-seed, or of psyllium, which should be employed every two hours, and the patient's eye defended from the contact of the air and light by means of a soft compress and bandage. In cases, however, where, besides the ulceration of the cornea, the conjunctiva and its vessels are in some degree relaxed, it is useful towards the end of the treatment to introduce Janin's ointment between the eyeball and eyelids, proportioning the quantity and strength of the remedy to the particular sensibility of the subject.

With respect to the treatment of those very superficial excoriations of the cornea, in which there appears to be no excavation of the substance of that membrane, and which in reality consist only in an abrasion of the cuticle, from the lamina of the conjunctiva, which covers the cornea, the use of the caustic is unnecessary.

* Institutiones Chirurg. § 314.

It is sufficient in these cases to employ the vitriolic collyrium with mucilage, or that consisting of vitriolated zinc and the white of an egg beaten together, with the addition of rose or plantain water. The symptoms which accompany these slight excoriations, or rather deprivations of the epidermis, are inconsiderable; and provided the patient take care to inject either of these collyria every two or three hours, and to defend his eyes from too vivid a light, and from vicissitudes of the atmosphere, they are generally removed in a short time.

Hitherto I have spoken of the ulcer of the cornea, and of the best method of treating it, in cases which are most frequently met with in practice. Occasionally, however, whether in consequence of the violence of the disease, or of improper treatment, the ulcer, already of considerable extent, assumes the form of a fungus elevated upon the surface of the cornea, which appears to derive its nourishment from a small fasciculus of blood-vessels belonging to the conjunctiva, and on this account not unfrequently gives rise to a very serious error, the disease being mistaken for a *pterygium*. This disease, when left to itself, or treated with slight astringents, generally terminates in the destruction of the whole eyeball; it demands, on the contrary, the speedy use of some efficacious means capable of destroying, in a short time, the whole of the fungus of the cornea, as well as the vessels which pass to it from the conjunctiva, and which has also the power of arresting its de-

structive progress. This method consists, in the first place, in removing the whole of the fungus close to the surface of the cornea with the curved scissors, continuing the incision at the same time upon the conjunctiva, so as to include along with it the fasciculus of blood-vessels, from which it appeared to derive its support. Afterwards, when the blood has been allowed to flow, the argentum nitratum should be freely applied upon all that part of the cornea which had been previously occupied by the fungus, so as to leave a deep eschar; on the exfoliation of which, if the whole of the morbid part should not have been destroyed, it will be necessary to repeat the application of the caustic, until the ulcer upon the cornea assume a healthy and granulating appearance.

In order to execute properly so deep a cauterization, it is not sufficient, in general, that the upper eyelid should be firmly held by an assistant, and the lower one depressed; but it is also requisite that the operator should keep the upper eyelid raised by means of a small spatula introduced between it and the eyeball, and held in his left hand, while with his right he applies the caustic upon the fungous surface of the ulcer, and retains it there a sufficient length of time to form a firm and deep eschar.

It must be admitted that in very severe cases of this kind, the action of the caustic cannot be always calculated with precision; and it consequently happens, that together with the fungus a portion of the whole thickness of the cornea is destroyed. When this accident occurs, it is

always followed by a protrusion of the iris through the perforation made in the cornea. This accident, however serious it may appear to some, is not, however, such as to admit of no relief, as will be shewn in the chapter on the procidentia of the iris, and provided the surgeon is able to obtain a solid cicatrix, in the part occupied by the excrescence, which must necessarily prevent a return of the fungus, and the total destruction of the eyeball, he will have completely fulfilled the proposed indication.

CASE XXXIII.

Antonio Carovo, of Pavia, a boy, 14 years old, was admitted into the practical school of surgery, who suffered great pain in his right eye, and was in danger of losing it, from two small ulcers upon the cornea, which had supervened in consequence of a violent *acute* ophthalmia.

One of these ulcers occupied the inferior segment of the cornea, the other that towards the external angle of the eye; both were sloughy and of a cineritious colour. The blood-vessels of the conjunctiva, especially those which corresponded to the ulcerated part of the cornea, were extremely turgid. The boy complained of acute pain in the eye and head, and could not bear even the most moderate degree of light.

Having placed him in a supine posture, with his head a little elevated, I directed an assistant to raise the upper eyelid, by means of *Pellier's elevator*, while with my left hand I depressed the

lower. This is the only method, especially in children, of fixing the eyeball sufficiently for the purpose of applying the caustic with precision to the ulcerated points* of the cornea. Then with the argentum nitratum, cut in the form of a crayon, I cauterized both the ulcers so as to produce upon them a sufficiently deep and adherent eschar, washing the eye frequently afterwards with new milk. The patient complained at the moment of very acute pain, but half an hour after he was perfectly easy in every respect.

On the following day, he was able to support a moderate degree of light, and the blood-vessels of the conjunctiva appeared very much less turgid than before the application of the caustic.

Three days after, on the exfoliation of the eschar, the former pains in the eye returned, but were less violent than at first. The ulcers were again touched with the caustic, which occasioned less uneasiness than before. It was repeated four days afterwards.

On the detachment of the last eschar, the ulcers were much diminished, and their surface, which was of a pale red colour, was raised on a level with the surface of the cornea. The vitriolic collyrium, with mucilage of quince-seed, was now substituted for the caustic, and dropped into the eye every two hours.

In the course of ten days more the ulcers were perfectly healed, and the ophthalmia entirely dissipated. And to render the cure more perfect, I ordered the patient to continue the collyrium for a month longer, and to introduce

between the eyelids, at bed-time, a small quantity of the ophthalmic ointment of Janin.

CASE XXXIV.

A beggar boy, 11 years old, of a weak constitution, and occasionally subject to periodical fever, some years after the small-pox, which had left a morbid sensibility in the left eye, was seized with a violent *acute* inflammation of it; in consequence of which a small abscess formed between the laminæ of the cornea, which burst spontaneously, and left a small sloughy ash-coloured ulcer, of an oval figure, which extended from the inner side of the margin of the cornea, almost as far as the part opposite the centre of the pupil. The boy complained very much, especially on being exposed to the light, and there was a copious weeping of the eye. The vessels of the conjunctiva also were exceedingly turgid, especially towards the internal angle of the eye. The argentum nitratum was applied to the ulcer, and its action limited, by repeatedly washing the parts with milk, and applying upon them bags of emollient herbs. The very acute pain produced by the caustic continued about half an hour; it then ceased, and the patient passed the rest of the day comfortably, and slept soundly the whole of the following night. The next day he opened his eye freely, and supported a moderate degree of light without uneasiness. The ophthalmia and weeping of the eye were greatly diminished.

On the separation of the eschar, the acute pain in the eye, the aversion to light, and the discharge of tears returned. The caustic was therefore repeated, and was attended with the same advantage as before.

Three days afterwards, on the separation of the second eschar, I found the ulcer very much contracted, attended with little pain, and the bottom of it presenting, instead of a cineritious, a pale red, and granulating appearance. I ordered the collyrium vitriolicum, with mucilage, to be dropped into the eye every two hours, and the part to be constantly defended from the contact of the air and light, by means of a compress and bandage, and in a few days the sore healed. The blood-vessels of the conjunctiva, which were a little varicose, still kept up some degree of redness upon the white of the eye, and the boy was attacked with a tertian fever, attended with violent shiverings. I gave him the cinchona, with a few drops of the tincture of opium; the use of which was continued in small doses for a considerable time after the fever was subdued. Besides the vitriolic collyrium, the ointment of Janin was employed, which contributed materially to invigorate the vessels of the conjunctiva, and to remove entirely the chronic redness of the white of the eye. The cicatrix, though certainly very near the pupil, did not cover it, and consequently did not deprive the child of the sight of the eye.

CASE XXXV.

Giuseppe Reale, of S. Leonardo, a strong plethoric countryman, 22 years of age, was attacked with a violent *acute* ophthalmia in both his eyes, attended with fever and violent pain. On the 7th day he came to the school of surgery, after having been once bled. His right eye was greatly inflamed, and there was an ulcer upon the inferior margin of the cornea, but not very deep; the left, which was equally inflamed, had an ulcer upon the external margin of the cornea, not larger in extent than a millet seed, but excavated and deep. The patient's pulse was hard and vibrating, the fever continual, and he had an inclination to vomit.

I immediately ordered 18 ounces of blood to be drawn from the arm, and at night 10 ounces more from the foot, and directed that bags of emollient herbs should be applied upon the eyes. He had a less uneasy night than the preceding, his pulse became soft and undulating, and his skin moist. As he complained of nausea I ordered him an emetic, which procured a copious and salutary evacuation of bilious matter; so that on the 4th day from the patient's entrance into the hospital, the inflammatory stage of the ophthalmia might be considered as having terminated.

Both the ulcers were now touched with the argentum nitratum. In order to keep the patient's bowels open, and to encourage a state of perspiration, I ordered him, the following day, a pint of the decoction of the radix tritici repent. with two drams

of the crystals of tartar and a grain of tartarized antimony, to be taken in divided doses, and continued for several days.

The application of the cautery allayed the violence of the pain in the eyes. When the eschars came away, the ulcers were again touched with the argentum nitratum, and this was repeated three times in the course of eight days; by means of which the ophthalmia diminished, the granulating surface of the ulcer of the left eye arose on a level with the surface of the cornea, and that of the right eye was almost entirely healed. The collyrium vitriolicum, with the mucilage of psyllium dropped into the eyes every two hours, was afterwards sufficient to complete the cure; and as the cicatrices of the cornea did not extend opposite the pupil, they did not obstruct the vision.

CASE XXXVI.

Celestina Pacchiarotti, a child, two years and a half old, was brought by her mother to the school of surgery, in order that I might examine the right eye, which after a recent and severe attack of the small-pox had remained swollen, red, painful, and watery. I found upon the cornea, on the side next the nose, a small ulcer of a cineritious colour of the size of a millet seed, and on the opposite side of the cornea, that is, towards the temples, a small incipient abscess.

I ordered that the ulcer should be immediately touched with the argentum nitratum. The mother was charged to drop into the eye a little

milk, and to bring the child every morning at the hour of dressing.

After the application of the caustic, the child remained easy for three days; but when the eschar separated, she again shewed signs of great pain and heat in the eye. The ulcer was again touched with the argentum nitratum, and on the detachment of the second eschar, which was four days after, I found it so small and superficial, that it might be considered as on the point of closing. In four days more, indeed, by merely dropping into the eye the vitriolic collyrium, with mucilage, it was completely healed.

The small abscess which occupied the margin of the cornea on the side of the temples, and which had hitherto remained stationary, increased and caused a return of the pain and tension in the eye; it afterwards burst and degenerated into an ulcer similar to the first. I instantly applied the caustic to this sore also, as I had done to the preceding. A blister was also put upon the neck, and the child was repeatedly purged with the syrup of succory and rhubarb. It was necessary to touch the ulcer a second time with the argentum nitratum before it appeared disposed to produce healthy granulations, and to contract; which effects were obtained in six weeks from the exfoliation of the second eschar. The cure was completed by the regular use of the vitriolic collyrium and mucilage for two weeks; which not only contributed in a great degree to heal the second ulcer, but also to strengthen the vessels of the conjunc-

tiva, and to clear the whole of the white of the eye.

CASE XXXVII.

Giuseppe Pa bieri, of Pavia, aged 23, a saddler by trade, of a slender constitution, and occasionally subject to intermittent fever, was attacked, towards the end of September 1796, with an erysipelas on the right side of the face, which caused a considerable tumefaction of the eyelids and conjunctiva of the right eye. This affection disappeared in ten days, by observing a proper diet, and by applying upon the face, as is the practice among the common people, the inner bark of the elder.

A month after, on being exposed to a sharp and cold wind, the right eye became very much inflamed. He repeated the same remedies as before, but finding that the pain, heat, want of rest, discharge of tears, fever, and intolerance of light increased, he came to the hospital. I found upon the lateral external part of the right eye, an ulcer, a line in length, and a quarter of a line in breadth, but very deep.

As I had not at that moment an opportunity of allowing him a bed in the hospital, I touched the ulcer with the caustic, and gave him proper instructions for prosecuting the treatment at home. He did not return for advice till ten days after, consequently long after the exfoliation of the eschar, and I found him in a worse state than before. A bed was allotted to him, and I began by

ordering him a bread and milk poultice to be applied upon the eyelids, for the purpose of diminishing the excessive tension of the eye and surrounding parts, and to be repeatedly purged with the *opening* powders, composed of crystals of tartar and tartarized antimony.

In less than three days the tumefaction of the eyelids subsided, and I immediately touched the ulcer with the argentum nitratum, and produced a deep eschar. It was necessary to apply the caustic three times more in the course of eleven days, before the ulcer lost its cineritious appearance, and was disposed to granulate and heal. By this treatment the pain in the eye, and the chronic ophthalmia, from relaxation of the vessels of the conjunctiva, gradually diminished, in proportion as the ulcer contracted.

When the bottom of the wound was nearly on a level with the surface of the cornea, I ordered the patient to instil the vitriolic collyrium with mucilage of quince-seed every two hours, by means of which the ulcer was perfectly healed, and the patient regained the entire use of his eye.

CHAP. XI.

OF THE PTERYGIUM.

THE term *pterygium* is applied by surgeons to the small preternatural membrane of a reddish-ash colour, and triangular figure*, which in general arises from the internal angle of the eye, near the *caruncula lachrymalis*, and extends by degrees upon the cornea, attended with considerable injury to the sight.

Although this small membrane most frequently originates from the internal angle of the eye, it is sometimes seen to proceed also from the external angle†, and in some cases from the superior or inferior hemisphere of the eyeball. From whatever part it may arise, however, it is a constant fact that the membrane is invariably of a triangular figure, the base of which is situated upon the white of the eye, and the apex upon the cornea, sometimes at a greater, sometimes at a smaller distance from the centre of the cornea and of the pupil. In some cases, though rarely, two or three *pterygia* of different sizes are met with upon the same eye, placed at different distances from each other around the circumference of the ball, with their apices directed to the centre of the cornea, where, if unfortunately they meet together, they cover the

* Plate II. fig. 3, a.

† Plate II. fig. 3. b.

whole of its surface with a dense veil, and produce a complete loss of sight. This complicated form appears to me to be precisely what the ancient physicians have called the *pannus* of the eye.

The *chronic varicose* ophthalmia, with relaxation and thickening of the conjunctiva, the *nebula* of the cornea, and the *pterygium*, differ from each other only inasmuch as they are greater or less degrees of the same disease. For all the three consist in a varicose, relaxed, and atonic state of a certain portion of the conjunctiva. In the *chronic varicose* ophthalmia, the preternatural fulness and nodosity of the veins, as well as the flaccidity and thickening of the conjunctiva, are confined to the white of the eye; in the *nebula*, particular branches of varicose veins are continued in a dilated and knotty state to a certain extent, upon the fine lamina of the conjunctiva, which covers the external surface of the cornea; and in the *pterygium*, in addition to this varicose state of the vessels, there is a preternatural thickening of the thin lamina of the conjunctiva covering it, upon which the small varicose veins are situated. Hence it is that the *pterygium* appears at first to be a new membrane formed upon the cornea, whereas it is nothing more than the fine lamina of the conjunctiva, forming its natural external covering, which in consequence of the *chronic* ophthalmia has degenerated from a transparent into a thick and opake tunic interwoven with varicose vessels. In cases of *pterygium*, therefore, the disease is not a new production formed upon the eye, but an alteration of some one of the fine and transparent membranes

which cover it.* And a convincing proof of it, as will be afterwards shewn, is, that the *incipient pterygium* may be cured in the same manner as the *nebula* of the cornea; that is, not by detaching it from the surface of the cornea, but merely by extirpating it at the part where the cornea and sclerotica unite, in the manner employed for destroying the communication between the minute ramifications of the varicose veins of the conjunctiva and their trunks, from the former of which the *nebula* is produced and nourished.

The *pterygium*, as I have said on the subject of the *nebula* of the cornea, would be a disease no less frequent than the *varicose chronic* ophthalmia, which so often occupies the white of the eye, if the fine and transparent lamina of the conjunctiva, which invests the cornea externally, were not of a texture far more dense and compact than the rest of that membrane; and if the small vessels which are distributed upon it were not very fine, tense, and not so easily distended as their trunks, which are seated upon the rest of the conjunctiva, covering the anterior hemisphere of the eyeball. Hence it is, that considering the frequent occurrence of the *chronic varicose* ophthalmia, the *pterygium* is rather an unusual disease. If, however, the very minute vessels of the lamina of the conjunctiva covering the cornea, once yield to the impulse of the fluid propelled into them, and become varicose, it follows, that as the cellular membrane which envelopes these vessels becomes gradually tumefied, the fine and transparent lamina situated upon the cornea, is necessarily converted into a pulpy

and reddish coloured tunic, which is precisely that of the *pterygium*.

That the *pterygium* is, in reality, nothing more than the natural expansion of the thin transparent lamina of the conjunctiva converted, to a certain extent upon the cornea, into a pulpy, flaccid, varicose membrane, is rendered probable from the folds which the *pterygium* and the conjunctiva corresponding to it form, whenever the eyeball is rolled on the side on which the disease is situated; and, on the contrary, from the tension which takes place in those parts, when the ball of the eye is turned in the contrary direction. And this is still further confirmed, from observing, that in the former position of the eyeball the *pterygium* may be as easily laid hold of by the forceps, and raised in the form of a fold, as the part of the conjunctiva corresponding to it, which is equally relaxed, varicose, and red.

In the dead bodies of those who have had this disease, when the flaccid and thickened part of the conjunctiva of the white of the eye, corresponding to the portion of cornea, rendered opake by the *pterygium*, has been carefully separated and removed, I have constantly found that the *pterygium** was as easily detached from the cornea, as from the white of the eye, leaving the former at the part which it occupied denuded, and evidently deprived of the covering which it naturally receives from the fine transparent lamina of the conjunctiva. Nor have I been able in any instance to divest the

* Plate II. fig. 4. a. b.

cornea of its natural covering, beyond the seat of the disease. When, likewise, there are several *pterygia* upon the same eye, at different distances from each other, there are so many flaccid, varicose, pulpy portions of the conjunctiva met with forming the base of each of them; while the rest of that membrane, covering the white of the eye, remains closely united to the eyeball, without any appearance of varicose vessels upon it, except at those parts where the relaxation of the conjunctiva, and the nodosity of the vessels have, as it were, thrown to a distance the roots and rudiments of the *pterygium*.

It is worthy of observation, that whether the *pterygium* be great or small, and in whatever part of the circumference of the eyeball it is formed, it constantly retains its triangular figure; its base being situated upon the white of the eye, and its apex upon the cornea. The constancy of this fact ought to be referred, in my opinion, to the adhesion of the lamina of the conjunctiva becoming stronger, in proportion as it advances from the circumference towards the centre of the cornea. For in consequence of such structure and different degree of cohesion which actually exists in the sound eye, it must necessarily follow, in the first place, that the progress of the *pterygium* ought to be in every case of such disease much slower upon the cornea than upon the white of the eye; secondly, that from the greater resistance which it always meets with, in proportion as it extends towards the centre of the cornea, it must, from mechanical necessity, assume a triangular form, the base of which cor-

responds to the white of the eye, the apex to the centre of the cornea. Forestus* has particularly remarked the constancy of this phænomenon, and speaking of the *pterygium*, he adds, *non cooperit oculum nisi in forma sagittæ.*

From this appearance and figure, which the disease invariably assumes, arises one of its principal diagnostic characters, by which the true *pterygium* is distinguished from the spurious, or from any other soft, fungous, reddish coloured excrescence, which externally darkens the cornea. For excrescences are sometimes formed upon the cornea, which, from their colour and soft membranous consistence, very much resemble the *pterygium*, although they are very different from it, being in reality the substance of the cornea itself, which has degenerated into a soft and fungous substance. But these species of false pellicles, independently of their being almost always more elevated upon the cornea than the *pterygium*, have constantly an irregular and tuberculated figure, and never represent a triangle with the apex directed from the margin towards the centre of the cornea.

Another distinguishing character of the *pterygium* is, the facility with which the whole of it may be collected and raised in a fold upon the cornea by means of the forceps; while every other species of excrescence attached to this membrane remains firmly adherent to it, and does not admit of being folded in any manner, or elevated from the surface of it. This peculiarity is of the greatest

* Oper. Med. lib. ii. Observ. 6.

importance in the treatment of the disease, since the true and genuine *pterygium* may be cured in the simplest manner; while, as I have stated at the end of the preceding chapter, the fungous excrescence of the cornea cannot be radically extirpated and perfectly healed without the greatest difficulty. Plenk * remarks with much propriety: *pterygia, quæ filamentis solummodo adhærent, facile abscinduntur, difficillime quæ ubique accreta sunt corneæ, ac in plicam elevari non possunt.* But if this excrescence, although of a triangular figure, and constituting the true *pterygium*, adheres firmly to the cornea, and is of a deep red colour, resembling lac, bleeds readily on being touched, and occasions lancinating pains, which shoot through the eye and temples, the disease threatens to become of a malignant cancerous nature, or is so already; and therefore ought only to be treated by palliative means, or by the extirpation of the whole eye, or of its anterior hemisphere.

The cure of the true benign *pterygium*, or that which is of a triangular figure, of a cineritious or pale red colour, unattended with pain, and which may be raised in the form of a fold, is obtained by removing it with exactness from the surface of the cornea. But since, from what has been stated, the *pterygium* consists in an alteration of the transparent lamina of the conjunctiva into a dense and opake tunic, in consequence of the varicose *chronic*

* De morb. ocul. page 97.

Avicenna, lib. iii. fen. 3 cap. 23., says: duræ, speaking of the cornea, denudatio quando non est facilis, perducit ad nocumentum.

ophthalmia, it necessarily follows that the disease cannot be removed by any means [illegible], without that part of the cornea which it occupies being deprived of its natural exterior integuments. And as this deprivation of the natural covering of the cornea renders a cicatrix at that part inevitable, it follows also, that it is impossible to cure the disease by an operation, without such portion of the cornea, in which the *pterygium* was seated, remaining more or less dark. The young surgeon, therefore, for whom these observations are intended, should not suffer himself to be imposed upon by the specious relations of those who assert that they have removed *pterygia* by the knife, and completely restored the cornea to its original natural transparency. The cornea certainly appears less opake at that part than before; but it always remains dark, and clouded by an indelible, though superficial cicatrix. The advantage derived from the operation is, however, always considerable, inasmuch as it prevents the progress of the disease, or the further increase of this varicose and thickened state of the thin pellucid lamina of the conjunctiva, and at the same time removes the local cause of irritation and afflux to the eye, and thereby prevents the complete opacity of the cornea. If it has happened, therefore, that after the excision of an extensive *pterygium* the patient has recovered his sight, it ought to be understood some degree of sight, or in the proportion which there is between a dense membrane, entirely obstructing the passage of the light, and a thin su-

perficial cicatrix, which does not intercept it altogether.

All that I am able to assert, from repeated observation, as certain and invariable, is, that after the excision of the part, the superficial and indelible speck which remains upon the cornea is always less extensive than the space which the *pterygium* previously occupied. Whether this arise in consequence of the lamina of the conjunctiva at the circumference of the *pterygium*, not being entirely disorganized, but only filled with a thick humor, and merely affected with *nebula*, which, by means of the excision, unloads itself of the tenacious humor which it contained, and consequently recovers its former transparency; or because the cicatrix at the part from which the *pterygium* has been extirpated, as generally takes place in all wounds, becomes actually less extensive than the parts which have been removed; certain it is, that this phænomenon is invariable, and that in a great number of cases in which I have performed the operation, of which some have extended two lines, others two lines and a half upon the cornea towards its centre, in all, after the cure was complete, the cicatrix and obscurity of the cornea were less, and did not exceed one line and a half, or little more, in cases where the *pterygium* was two lines in extent.

The excision of the *pterygium* is an operation easily executed. It is not necessary for this purpose to have recourse to the curved needle, threaded with silk, with which the greater part of sur-

geons direct the membrane to be pierced, for the purpose of forming a noose, by which it may be raised, and then divided at its base. This method is inconvenient, not only on account of its greatly prolonging the operation, but because the blood which flows from the perforations prevents the extent of the parts which are intended to be removed from being seen with the precision which is requisite. The forceps and very sharp scissors* are sufficient for the purpose.

The *pterygium* is in general removed by beginning the excision upon the cornea, and continuing it upon the white of the eye, as far as the extent of its base in the conjunctiva, so that when the disease proceeds from the internal angle of the eye, the incision is prolonged by the generality of surgeons as far as the caruncle. The disadvantage attending this practice is, in the first place, that the white of the eye is denuded to too great an extent; secondly, that in consequence of the great quantity of substance of the conjunctiva, which is removed at the base of the *pterygium*, and the direction in which it is executed, the cicatrix resulting from it upon the white of the eye, forms an elevated ridge, which, like a small cord, confines the ball of the eye to the *caruncula lachrymalis*, and prevents the freedom of its motions, particularly in the lateral direction.

In order to avoid this inconvenience, I have found it better, in the treatment of *pterygia* which have a very extensive base upon the white of the eye, to divide them, from the apex only, as far

* Plate III. fig. 3.

as the part where the cornea and sclerotica unite; and then to separate them at their base by a semicircular incision*, including about a line in breadth of the substance of the conjunctiva, in a direction concentric to the margin of the cornea. By operating in this manner, I have found that the after-treatment is much shorter than when it is executed after the common method, that the cicatrix does not form a ridge or frænum, and the conjunctiva being stretched circularly and equably upon the white of the eye by the cicatrix, loses that relaxation and varicose state of its vessels from which the *pterygium* derived its base. This nicety is not, however, necessary where the *pterygium* is small, and does not extend far upon the white of the eye.

The patient being seated for this purpose, an assistant behind him should raise the upper eyelid, with the middle and forefinger of one hand, and depress the lower with those of the other. The operator, supposing the affected eye is the right, should place himself before the patient, either sitting or standing, as shall be most agreeable to him; then desiring the patient to turn his eye a little from the side corresponding to the base of the *pterygium*, with the forceps held in his left hand a little open, he should take hold of the *pterygium* at about a line from its apex, and press it in the form of a fold, which he should then raise and draw gently upwards towards him, until he perceive a small crackling, indicating the detachment of the

* Plate III. fig. 3. a.

pterygium from the fine cellular membrane which connects it to the subjacent cornea. Then, with the scissors in his right hand, he should divide the fold as close to the cornea as possible, in the direction from the apex to the base; and having carried the incision as far as the part where the cornea and sclerotica unite, should raise the fold again still higher, and with one stroke of the scissors, as concentric and close to the margin of the cornea as possible, remove the *pterygium*, together with a portion of the relaxed conjunctiva, forming the base of it. This second incision should have the figure of a crescent*, the points of which ought to extend a few lines beyond the relaxed portion of the conjunctiva, following the curve of the eyeball.

After the operation, the blood should be encouraged to flow, by washing the parts with warm water, and the eye covered by a compress, either dry, or moistened with the aqua litharg. acetat. comp. and supported by a bandage, which should not compress the parts too much.

If no remarkable symptoms should arise, as pain, tension of the eye, or great tumefaction of the eyelids, it will be sufficient that the eyeball and internal surface of the eyelids be washed three or four times a day, with tepid mallow-water, and the parts carefully defended from the contact of the air, without being compressed. If, however, such symptoms should occur, it will be necessary to have recourse to the antiphlogistic regimen, the applica-

tion of bags of emollient herbs to the eye, and the introduction between the eyelids of the white of egg, or mucilage of the seeds of the *psyllium* extracted with mallow-water.

On the 5th or 6th day, in general, from the operation, the surface of the wound appears of a yellow colour, and covered with mucus; a form of suppuration peculiar to membranes in general, and the eyeball in particular, while its edges, and the rest of the conjunctiva surrounding them, are red. Afterwards the wound gradually contracts itself every day more and more, until it entirely disappears, and the cicatrix is complete.

During the whole of the treatment, from the time of the operation, the only application necessary is a lotion of mallow-water three or four times a day. I have been convinced, from repeated observation, that astringent collyria, and the powders which are so highly extolled, as that composed of the Florentine orris and alum, occasion great irritation in the eye, and a tumefied and fungous state of the conjunctiva; all of which directly oppose the healing of the wound. And what is more disagreeable, they give rise to little tufts of fungus in the centre of the sore, which are with difficulty repressed and healed. I have seen all these inconveniences produced by a single unnecessary application of the argentum nitratum. On the contrary, by simply washing the parts with the aqua malvæ, the cure proceeds regularly, the yellow surface of the wound contracts daily, and the cicatrization is completed in the easiest manner in the space of three, or at most four weeks. Afterwards it may

be useful to drop into the eye three or four times a day the vitriolic collyrium, with a few drops of camphorated spirit of wine added to it, in order to strengthen the conjunctiva and its vessels.

I have before remarked, that the *incipient pterygium* is in reality nothing more than the *nebula* of the cornea, in which the veins of the conjunctiva, investing that part of it where the disease is situated, are a little more dilated than in cases of the latter; and that the fine lamina of the conjunctiva acquires a greater degree of density and opacity in that part, than when it is simply affected with the *nebula**. To express myself more clearly, the *pterygium* in this case is not a dense and opake membrane, but a pellicle of the fineness of a spider's web, interwoven here and there with varicose blood-vessels, behind which the iris is yet sufficiently perceptible. In this state of the disease, it is not necessary to deprive that part of the cornea of its natural covering. It is sufficient, as in the treatment of the *nebula* of the cornea, to destroy by excision the communication between the dilated ramifications of the veins of the *pterygium*, and the varicose trunks situated upon the white of the eye. This is obtained by removing a small portion of the conjunctiva of a semilunar figure, with the forceps and scissors, at the part where the cornea and scle-

* This middle state between the *nebula* of the cornea, and the confirmed *pterygium*, is denominated, by the Arabian writers, Sabel. Sabel, says Avicenna, est panniculus accidens in oculo ex inflatione venarum ejus apparentium in superficie conjunctivæ et corneæ; et texitur quiddam in eo, quod est inter eas, sicut fumus. Lib. iii. fen. 3. tract. 2. cap. 19.

rotica unite, precisely at the base of the *incipient pterygium*, in the same manner as in the treatment of the *nebula*. After this operation, the *incipient pterygium* is observed to be gradually dissipated, or a slight opacity of the cornea only remains to a certain extent at the part occupied by it, which, however, is, most frequently, far less considerable, than that which is left by a cicatrix. Acrell, in his *Chirurgical Observations*, relates his having cured an *incipient pterygium* in this manner; which I have also frequently repeated with success, but which I have thought it more proper to detail among the cases of *nebula* of the cornea than those of the *pterygium*, for the reasons already assigned, and principally because the morbid state of the lamina of the conjunctiva in these cases very little exceeds that in which this tunic is found, when it is only affected with the *nebula*. In a large proportion of cases of incipient *pterygium*, therefore, we may hope to arrest the progress by the timely use of astringent topics *, suited to restore the slightly dilated and varicose vessels of the conjunctiva to their proper size, as the ointment of Janin and the Tinctura Thebaïca.

CASE XXXVIII.

Antonio Cantoni, of Casorati, a peasant, 19 years of age, presented himself at the practical school of surgery on the 12th of November, 1792, with a *pterygium*, which extended from the external can-

* See Medical Essays and Observ. vol. vi. p. 457.—TRANS.

thus of the right eye, upon the cornea, very near to the pupil.

On the 14th of the same month, the patient being seated, and the triangular membrane taken hold of with the forceps, at the distance of a line and a half from its apex, and properly raised, I carefully separated it from the whole of the cornea; then taking hold of the varicose and relaxed conjunctiva, forming the base of the *pterygium* upon the white of the eye, and elevating it a little, I removed it in the form of a crescent close to the margin of the cornea, and in the same direction.

As there was no remarkable swelling of the eye or eyelids on the succeeding days, the parts were merely washed with the aqua malvæ, and covered with a compress and bandage.

The surface of the wound, as well upon the cornea as upon the white of the eye, diminished daily, and on the 10th of December was completely healed. It was observable, that the cicatrix of the cornea did not approach so near the pupil as the apex of the *pterygium*.

CASE XXXIX.

Mauro Pisani, a robust countryman, 45 years of age, was affected with a *pterygium* in the internal canthus of the right eye, which he had neglected so long, that it had at length covered two-thirds of the pupil, occasioning a great diminution of sight.

The operation was performed on the 22d of, Ja-

nuary, 1793. The fine membrane was very exactly separated, by means of the forceps and scissors, from the cornea, and a portion of the tumid varicose conjunctiva, forming the base of the *pterygium* upon the white of the eye, removed, in the form of a crescent. A greater quantity of blood flowed from the incision than might have been expected from the size of it.

On the 5th day after the operation, the yellowish layer of mucus, which is a certain indication of suppuration, appeared upon the surface of the wound. During the whole of the treatment, the patient used no other external remedy than a lotion of aqua malvæ three times a day, and was scarcely at all confined to his bed.

In twenty-six days the wound was perfectly healed. All that part of the cornea which had been obscured by the *pterygium* remained cloudy as before, but with this difference, that when completely healed, it occupied rather less of the pupil, and the patient, therefore, saw more distinctly than before the operation.

CASE XL.

A strong man, 34 years old, a carpenter by trade, had, for several years, a *pterygium* upon the right eye, which extended from the inferior hemisphere of the eyeball, where it is covered by the lower eyelid, towards the centre of the cornea, so as to cover about a fourth part of the pupil in a moderate light.

On the 12th of March, 1794, the patient being seated in the practical school, and the eyelids separated, particularly the lower, I took hold of the *pterygium* at a line and a half from its apex, and having raised it completely in the form of a fold, I divided it a little beyond the margin of the cornea; then laying hold of the conjunctiva with the forceps, where it covers the white of the eye, I removed the base of the *pterygium*, together with a segment of that membrane, in a direction concentric to the margin of the cornea.

The blood was allowed to flow, and the eye was covered with a fold of lint, moistened with the aqua litharg. acetat. comp. which was supported by a bandage.

The day after, the eyelids appeared swollen, red, and painful. I ordered the patient to be freely bled, and the eye to be covered with bags of emollient herbs. The following day he was purged. The inflammation was dissipated on the 7th day. The conjunctiva remained, however, exceedingly tumefied and red, and the surface of the wound did not yet appear covered with mucus.

On the 12th day from the operation, the mucous suppuration began to take place, and from that time the wound gradually diminished.

During the whole of the treatment, except the application of bags of emollient herbs at the commencement, no other external remedy was employed than the aqua malvæ. At the end of five weeks the wound was healed. The patient, however, used the vitriolic collyrium, with the mucilage of

quince-seed, four times a day, for fifteen days afterwards, and anointed the edges of the eyelids at night with the ophthalmic ointment of Janin. In this case also the cicatrix obstructed the pupil considerably less than the *pterygium* had done.

CASE XLI.

Francisco Vecchi, of Calignano, a countryman, 57 years of age, of a weak constitution, in the beginning of March, 1795, made application on account of two large *pterygia*, one upon each eye, which had occasioned a deformity for several years, and threatened ultimately to produce blindness; for that of the right eye, in a moderate light, covered two-thirds of the pupil, the other one half of the left. Both arose near the *caruncula lachrymalis*. This man was likewise affected with an habitual *chronic* ophthalmia in both his eyes.

The *pterygia* were removed in the manner related in the preceding cases. On the following day the eyelids and conjunctiva of both sides were enormously swollen, accompanied with redness, pain, and fever. I directed blood to be taken from his arm, and also from the neighbourhood of the eyelids, by means of leeches; he was restricted to a low diet, and ordered to take a pint of the radix tritici repent., with a grain of tartarized antimony in small doses, and to apply upon the eyelids bags of emollient herbs.

On the 8th day of this treatment, he became

easy, the inflammatory stage of the ophthalmia having ceased, and the eyelids greatly subsided. The conjunctiva, however, was exceedingly red, tumefied, and almost in a fungous state, and the yellowish surface of the wound was not yet covered with mucus. Being satisfied that the delay of the suppuration was partly owing to the atonic state of the vessels of the conjunctiva, I should have been tempted to employ an astringent collyrium, had I not been warned by similar cases, in which the use of such applications, instead of removing the *chronic* ophthalmia arising from relaxation of the conjunctiva, had, on the contrary, reproduced the inflammation. In this case, therefore, and as it is now my usual practice, I was satisfied with using merely a lotion of mallow-water, and exciting an irritation in the neck, by the application of a large blister, which was kept open for some time, and also repeating it behind the ears.

On the 19th day from the operation, the tumefaction of the conjunctiva being very much diminished, the surface of the wound in both eyes began to suppurate, and to be covered with mucus. From this time the wound gradually contracted, until the 53d day, when it was completely healed.

The collyrium vitriolicum was now directed to be dropped into the eye several times a day, at first alone, but afterwards with a little camphorated spirit of wine added to it, and the ophthalmic ointment of Janin to be used at night; by continuing these remedies for two weeks, the conjunctiva recovered

its vigour, and the chronic redness of the eyes, proceeding from the relaxation of this membrane and its vessels, disappeared.

The cicatrix of the cornea of the right eye covered only a third, or little more, of the circumference of the pupil in a moderate light; and that of the cornea of the left eye only a fourth part of the pupil.

CHAP. XII.

OF THE ENCANTHIS.

THE *encanthis*, at its commencement, is a small, soft, reddish, or sometimes slightly livid excrescence, arising from the *caruncula lachrymalis*, and neighbouring *semilunar* fold of the conjunctiva. When inveterate, it is commonly of a very considerable size*, and extends its roots beyond the *caruncula lachrymalis*, and *semilunar* fold, as far as the internal membrane of either eyelid, or of both. In consequence of its originating and being placed between the eyelids at their internal commissure, which it necessarily keeps separated on that side, it occasions no inconsiderable inconvenience to the patient, by keeping up the *chronic* ophthalmia, and impeding the action of the eyelids, particularly that

* PURMANNUS, in his *Chirurgia curiosa*, page 133, has left us the description and figure of a tumor as large as the fist, proceeding from the internal angle of the left eye by a very slender peduncle, and hanging upon the cheek; the obscurity, however, which pervades the whole of the description of this disease, and the little accuracy displayed in the drawing, leave room to doubt whether the tumor originated from the *caruncula lachrymalis* and neighbouring *semilunar* fold, or from the integuments immediately on the outside of the internal commissure of the eyelids. PURMANNUS says, that he extirpated it with success, by first applying a ligature near its root, and afterwards touching it with the small button of a cautery, included in a canula.

of completely closing the eye; and partly by compressing, and partly removing the apertures of the *puncta lachrymalia* from their natural direction, it presents an obstacle to the free course of the tears from the eye into the nose.

This excrescence, in its early state, has generally a granulated appearance, resembling a mulberry; or is formed of small fringe-like pieces. But when it has acquired a considerable bulk, a part of it presents a granulated appearance, while the rest is smooth, and of a whitish or cineritious colour, streaked with varicose vessels, which occasionally advances so far upon the conjunctiva covering the eyeball on the side next the nose, as to reach the part where the cornea and sclerotica unite. When the excrescence has arrived at this advanced state, it not only constantly involves the *caruncula lachrymalis* and *semilunar* fold, but the internal membrane of one or other of the eyelids, or of both: besides the attachment, therefore, which the *encanthis* has, in such cases, to the *caruncula lachrymalis*, *semilunar* fold, and conjunctiva of the eyeball, it is observed to give off a firm and projecting appendix or process, along the internal surface of the upper or lower eyelid, in the direction of their edges; or the centre or body of the *encanthis* is, as it were, divided near the cornea, into two appendices or processes, resembling a swallow's tail, one of which extends along the upper eyelid covered by its margin; the other runs along the internal surface of the lower eyelid, concealed also by its margin, from the internal towards the external canthus of the eye.

The body of the *encanthis*, or that middle portion of the excrescence, which extends from the *caruncula lachrymalis* and *semilunar* fold inclusively, upon the conjunctiva of the eyeball, almost as far as the junction of the cornea and sclerotic coat, is sometimes as prominent as a hazel, or chesnut, at other times it is of this size, but depressed, and as it were flattened. The central part of the excrescence, however, preserves the granulated appearance which it had at first, while one, or both appendices, which are continued upon the internal surface of either or both eyelids, present, as I have said, rather the aspect of a *lipomatose* (fatty) than a granulated substance. If the eyelids are everted, these appendices or processes of the *encanthis* make an elevated projection, and when this takes place in both eyelids, on their being everted, these appendices form nearly a ring, which is closely applied upon the eyeball. This disease was known, and successfully treated by Fabricius Hildanus, to which he has applied the term *ficus schirrosus ad majorem oculi canthum* *.

* Centur. I. observ. 2. anno 1598, 20 Febr. ad ædes D. Petri Dumantii verbi divini ministri ad quadragenarium, habentem tumorem schirrhosum ad magnum oculi canthum castaneæ magnitudine colore livido, et multis venis capillaribus intertextum vocatus fui. Ille autem tumor ab una parte adhærebat conjunctivæ membranæ usque ad iridem ; ab altera vero hærebat palpebræ superiori, et lachrymali glandulæ ; ita ut ad oculi motum totam cooperiret pupillam scirrhus ille. Nos (ægro purgato, prout in præcedente observatione fusius declaravimus) incisa item cephalica in sinistro brachio, instititaque optima victus rationes præsente M. NICOLAO FEVOTTO, et DANIELE LE CLERC. Lausannensibus, forcipe nostra oculari hic delineata tumorem appre-

It appears, however, that in the case related by Hildanus, the *encanthis* had only one appendix situated upon the internal surface of the upper eyelid, under its margin.

The *encanthis*, as well as the *pterygium*, sometimes assumes a cancerous malignity, which is characterized by the dark red or leaden colour of the excrescence; its extraordinary hardness; the lancinating pains which accompany it, extending to the forehead, the whole of the eye and the temples, especially after it has been even slightly touched; by its disposition to bleed; and by its ulcerating in several points from which a fungous substance

hendimus. Tum attracta paulatim forcipe, et inversa superiori palpebra, tumorem cultello separatorio ad id aptato commode separavimus. Postea albumen ovi aqua rosacea mixtum imposuimus. Inde collyriis anodynis, et abstersivis et tandem exsiccantibus oculum intra septimanas tres, visu plane illæso, persanavimus. Interim tamen purgationes aliquoties interavimus, et cucurbitulas cum largiori flamma scapulis et nuchæ admovimus. Defensivum item fronti et temporibus applicuimus.

Collyrium anodynum. Rec. Mucilag. sem. cydon, plantag. cum aqua rosacea extractæ, lactis muliebris ana uncias II. camphoræ, croci ana scrupulum dimidium, misce et applica tepide.

Collyrium exsiccans. Rec. Aquarum plantag. rosar. ana uncias quatuor, tutiæ preparatæ, cornu cervi usti et preparati, cerussæ lotæ ana drachmam unam. Misce fiat collyrium. Hic monitos velim chirurgos; collyria in quæ ingreditur lac, æstate singulis, hyæme vero alternis diebus iteranda esse. Acescit enim lac, et acre efficitur: hinc dolores, et inflammationes excitat.

is thrown out, discharging a thin and very acrid humor. This worst species, or rather degeneration of the *encanthis*, admits only of a palliative treatment, unless the total extirpation of it should be attempted, together with all the parts contained in the cavity of the orbit; the success of which must be also very doubtful.

The benign *encanthis*, whether small or large, may be cured by means of excision. The small incipient *encanthis*, whether of a granulated or fringe-like appearance, arising from the *caruncula lachrymalis* and *semilunar* fold, or from a small part of the edges of the eyelids also, forming the internal angle or commissure, may be elevated by the forceps, and with the curved scissors, separated close to its base from the whole extent of its origin. For the purpose of executing this operation, it is not necessary, as is practised by some, to pass a needle and thread through the small excrescence, in order to raise it and detach it with precision from all the parts to which it adheres; as this may be accomplished by means of the forceps, without incommoding the patient by the punctures and introduction of a thread for the purpose of forming a noose. In the removal of that part of the small *encanthis*, however, which originates from the *caruncula lachrymalis*, it is necessary not to include more of the substance of the caruncle than is requisite for completely eradicating the disease, lest by removing too much of it, an irremediable weeping of the eye should be produced.

After the excrescence is extirpated, the eye should be repeatedly washed with cold water, in

order to clear away the blood, and covered with a linen cloth and bandage. On the 5th, 6th, or 7th day, when the inflammation occasioned by the operation has entirely ceased, and the mucous suppuration is established, the divided parts should be touched with a small button of alum, cut in the form of a crayon pencil, and the vitriolic collyrium, with mucilage of quince-seed, dropped into the eye several times a day. If these means do not produce the desired effect of healing the wounds, but on the contrary, those of the caruncula and internal commissure of the eyelids become fungous and stationary, they should be frequently touched with the argentum nitratum, carefully avoiding the conjunctiva as much as possible, especially if any part of it have been included in the incision. When the fungus has been destroyed, the treatment may be completed by the vitriolic collyrium, or by introducing an ointment consisting of fresh butter, the powder of tutty, and Armenian bole, between the eyeball and internal angle of the eyelids three times a day. Bidloo greatly extols the application of the powder of chalk, either simple, or combined with burnt alum. *Exercit. Anat. Chir. decad.* II.

The large inveterate *encanthis*, whether flattened in its body, or projecting in the form of a hazel or ches-nut, with one or two *lipomatose* appendices along the internal membrane of either or both eyelids, may be equally cured by the same means. The ligature can neverbe employed in this case in preference to excision, since the neck or peduncle of the excrescence is not sufficiently narrow to admit of its application; the *encanthis*, on the contrary, when

very voluminous, having constantly extensive attachments to the *caruncula lachrymalis*, *semilunar* fold, and conjunctiva, nearly as far as the cornea, and also one or two *lipomatose* appendices along the internal membrane of either or of both the eyelids. If, therefore, the body of the *encanthis* should be removed by the ligature, either one or both these processes would always remain to be extirpated, which second operation could only be executed by means of excision. The fear of hæmorrhage, in this operation, upon which the advocates for the ligature appear to lay so much stress, is unfounded, as the cases of large and inveterate *encanthis*, which have been removed, are now so numerous, without any unfavourable accident having happened on account of the loss of blood (to which I could add some of my own), that upon this point* there cannot be any room for doubt or discussion. Fabricius Hildanus, in the case of the large and inveterate *encanthis* before cited, in which there was only one *lipomatose* process along the internal membrane of the upper eyelid, after having taken hold of the body of the tumor with the tenaculum, and drawn it towards him, and having everted the eyelid, so that this appendage might project forwards

* Pellier, Recueil d'observ. sur les malad. de l'œil, part II. observ. 118., relates a case of excision of the *encanthis*, which, although executed, as he says, by an able oculist, was, however, followed by a dangerous hæmorrhage. He does not enter, however, into any detail of the nature of the disease, nor of the method of operating, from which one might have been enabled to deduce the causes of so unusual an occurrence. Indeed, he adds: J'ai souvent fait cette operation à des excroissances de cette nature, et jamais je n'ai éprouvé un pareil accident.

through its whole extent, with a small bistoury separated the process from the internal surface of the eyelid, and by continuing the incision, detached the body of the *encanthis* from the conjunctiva covering the eyeball, the *semilunar* fold, and *caruncula lachrymalis*. This operation was attended with the happiest success, and therefore ought to serve as a model and guide to surgeons in the treatment of this disease.

When, however, the inveterate, and very large *encanthis* has two *lipomatose* appendices, one along the internal surface of the upper, the other of the lower eyelid, it is then necessary to proceed in the following manner: the patient should be placed in a chair, and the upper eyelid everted by an assistant, so that one of the processes of the *encanthis* may project outwards. This being deeply divided in the direction of the edge of the eyelid, by means of a small bistoury *, and then taken hold of and drawn out by the forceps, should be entirely separated from the internal surface of the upper eyelid, longitudinally, proceeding from the external towards the internal angle of the eye, as far as the body or middle portion of the *encanthis*. The *lipomatose* process, situate upon the internal surface of the lower eyelid, should be separated in the same manner. The body of the *encanthis* should be afterwards elevated by means of the forceps, or, if this is not practicable, by a double hook, and then partly by means of the small bistoury, and partly by the curved scissors, completely detached from

* Plate III. fig. 12.

the subjacent conjunctiva which covers the eyeball, from the *semilunar* fold and *caruncula lachrymalis*, penetrating more or less deeply into the substance of the latter, as the firmness and depth of the roots of the disease may render it necessary; for it must be openly avowed, that in the treatment of the inveterate and very large *encanthis*, which is deeply rooted in the caruncle, it is not always in the surgeon's power to avoid the substance of that part so carefully, that when the wound is healed, some defect may not remain from the weeping of the eye.

The eye should be frequently washed with cold water, and the after-treatment in this case conducted nearly in the manner recommended in the extirpation of the small incipient *encanthis*. Frequent lotions of the aqua malvæ and anodyne and detergent collyria are the most proper applications, until the mucous suppuration in the divided parts be fully established; afterwards slight astringents, and the ointment before recommended, may be used with advantage. In general, the mildest applications are the most useful, not only in the stage preceding the suppuration, but afterwards; especially when, together with the *encanthis*, a considerable portion of the conjunctiva, covering the white of the eye on the side towards the nose, has been removed, to which the body of the excrescence was closely united.

The whole of this chapter will be strongly illustrated by the following case of Marchetti *. *Curavi quemdam canonicum Polonum laborantem meliceride*

* Observ. Med. Chirurg. Sylloge, obs. 21.

magnitudinis jujubæ, quæ a caruncula anguli majoris oculi ad totam pupillam porrigeb tur. A multis tentata curatio medicamentis, decoctis scilicet, collyriis et aliis hujusmodi; omnia tamen octo mensium spatio incassum adhibita. Cum vero me consuluisset, ipsum tumorem evellendum censui; quod cum reformidaret spe tamen salutis operationem admisit, quam statim molitus sum. corpore prius expurgato accuratissime ab aliis medicis. Paravi itaque hamulum, quo ipsam meliceridem perforavi, et manu apprehendi, altera vero forcipe eamdem cum folliculo sectione separavi tum a caruncula, tum a tunica adnata, et ipsa pupilla; atque ita totum tumorem eduxi sine ulla offensa ipsius oculi; a quibus statim applicui gossypium imbutum aqua rosacea cum ovi albumine agitata, et portiuncula croci. patiente tres dies hoc modo fascia vincto; adhibito postmodum collyrio cum aqua rosarum, et pulvere tutiæ præparatæ; quibus spatio octo dierum omnino convaluit æger; increpante licet meam præceptore meo ab Aquapendente *audaciam, cum tamen brevi spatio temporis id præstiterim, quod alii medici non potuerunt perficere: idque præsentibus præclarissimo* Joanne Dominico Sala *cum multis studiosis.*

CHAP. XIII.

OF THE HYPOPION.

By the term *hypopion*, I mean with the generality of surgeons, that collection of yellowish glutinous humor, similar to matter which takes place in the anterior, and not unfrequently also in the posterior chamber of the eye, in consequence of the violent *acute* ophthalmia, particularly where it is internal. For, as I have said, in speaking of the inflammation of the eyes, although the violent *acute* ophthalmia is, in the greater number of cases, principally confined to the external parts of the eye, it nevertheless occasionally attacks with an equal degree of violence the internal as well as the external membranes of this organ, particularly the choroidea and uvea. If, in the latter case, the inflammation, which affects the interior part of the eye, is not speedily arrested by the most effectual means, coagulable lymph transudes from the choroid membrane and uvea, which, in proportion as it is poured into the cavity of the eye, is carried into the chambers of the aqueous humor, passes before the pupil, and falls to the bottom of the anterior chamber, sometimes filling a third part of it, at other times half, and occasionally reaching so high as entirely to obscure and conceal the iris and pupil.

This tenacious fluid of the *hypopion* is generally

called, not only by the common people, but also by surgeons, *matter;* but, in my opinion, very improperly, in the sense at least in which this term is generally received. For in this case it is not the product of an abscess or ulceration of the internal or external membranes of the eyeball, but simply the result of a transudation of coagulable lymph from the internal surface of the inflamed choroidea and uvea; precisely as takes place in all other membranes of the body affected with violent inflammation, as the dura and pia mater, for instance, the pericardium, the pleura, the peritoneum, and the membrane proper to the viscera; all of which, under such circumstances, are covered with a glutinous surface, or thin layer of coagulable lymph, exactly similar to the viscid matter which is collected in the chambers of the aqueous humor constituting the *hypopion.* In the most frequent cases of *hypopion* at least, none the most accurate and experienced surgeon has hitherto demonstrated that this disease has been preceded by an abscess of the internal membranes of the eye; or has ever observed the *hypopion* in consequence of an ulcer of the choroidea or uvea. If, however, notwithstanding, it should be insisted that there is no essential difference between coagulable lymph effused from a membrane violently inflamed, and *matter*, it must then be conceded that there are cases in which matter is formed without abscess or ulceration, and that the *hypopion* is a disease precisely of this description.

The symptoms which would induce one to fear an effusion of coagulable lymph within the eye, or

the *formation* of an *hypopion*, are those of the violent *acute* ophthalmia in the most excessive degree: as great swelling of the eyelids; redness and tumefaction of the conjunctiva, as in the *chemosis*; burning heat in the eye with acute throbbing pain in it, as well as in the supercilium and neck; fever, watchfulness, aversion to the weakest light, and contraction of the pupil.

As soon as the *hypopion* begins to be formed, a small yellow line, in the form of a crescent, is seen at the bottom of the anterior chamber of the aqueous humor, which, in proportion as the glutinous humor transudes from the inflamed membranes of the eye, and passes forwards through the pupil, and is precipitated into it, increases in all its dimensions, and gradually conceals first the lower hemisphere of the iris, then ascends as high as the pupil, and finally covers the whole circumference of that membrane. As long as the inflammatory stage of the violent *acute* ophthalmia subsists, the *hypopion* continues to increase; but as soon as this stage ceases, and the ophthalmia enters upon the second period, or that from local debility, the quantity of coagulable lymph forming the *hppopion* is no longer augmented, but is rather disposed to diminish.

This fact sufficiently shews the importance of arresting the progress of the *hypopion*, by employing, in the most rigorous manner, those means which are most efficacious in suspending and repressing the impetus of the violent *acute* ophthalmia in its first stage. In such cases, therefore, copious, general, and local bleeding should imme-

diately be had recourse to, and in the case of *chemosis*, the division of the conjunctiva; mild purgatives should be employed, blisters to the neck, bags of emollient herbs, and other auxiliaries of this kind, which have been already enumerated in treating of the first stage of the violent *acute* ophthalmia. This intention is known to be accomplished, by observing, that, some days after this treatment, although the redness of the conjunctiva and eyelids still continues, the lancinating pains in the eye have ceased; the heat and fever have considerably diminished; the patient's sleep and general ease are restored; that the eye can be easily moved; and, lastly, that the collection of tenacious humor forming the *hypopion* has become stationary. It is not uncommon, especially among the lower classes of people, to see patients in the second stage of the violent *acute* ophthalmia, who carry this collection of coagulable lymph deposited in the chambers of the aqueous humor with the utmost indifference, and without complaining of any of those symptoms which characterize the *acute* stage of the disease. It is only at this period, I have said, or when the acute stage of the violent ophthalmia is over, that the *hypopion* ceases to augment, and the glutinous matter of which it is formed begins to be dissolved, and in a state to be absorbed, provided this salutary operation of nature is not prevented or retarded by the improper conduct of the patient.

To those who are little acquainted with the treatment of diseases of the eyes, it would certainly appear that the most expeditious and effec-

tual method of treating the *hypopion*, which has become stationary in the second stage of the violent *acute* ophthalmia, would be that of making an incision in the lower part of the cornea, in order to give a speedy issue to the matter contained in the chambers of the aqueous humor; particularly as this is the doctrine which is commonly taught in the schools of surgery. Yet experience proves the contrary, and demonstrates that the division of the cornea in these cases is seldom attended with success, and that, on the contrary, it most frequently gives rise to evils of greater magnitude than the *hypopion* itself, notwithstanding the modification suggested by Richter*; that is, of not evacuating the matter of the *hypopion* all at once, nor of promoting the discharge of it through the incision in the cornea, by means of repeated pressure or injections, but of allowing the lymph to be slowly discharged of itself. From a very considerable number of observations made upon this subject, I have found, that however small the wound made in the lower part of the cornea may be for the purpose of giving issue to the matter of the *hypopion*, it most frequently reproduces the inflammation, and occasions a greater effusion of coagulable lymph into the chambers of the eye than before. And if, even after the division of the cornea, the matter of the *hypopion* be permitted to flow out gradually and by drops, in consequence of its tenacity some days elapse before it is entirely evacuated; and the glutinous lymph by keeping open, in the mean

* Observ. Chirurgicarum fasciculus primus, cap. 12.

time, the wound in the cornea causes it to suppurate and degenerate into an ulcer, through which, after the tenacious fluid is evacuated, a discharge of the aqueous humor takes place, and afterwards a protrusion of a portion of the iris; by the division of the cornea, therefore, nothing more is generally effected than changing the hypopion into an ulcer of the cornea, with procidentia of the iris, and sometimes even of the crystalline*. Nor can any particular instance of success, in which the matter of the *hypopion* has been spontaneously discharged from a narrow fissure in the cornea, be adduced as an argument in favour of an artificial division of this membrane by the knife, in cases of stationary *hypopion* in the second stage of the violent *acute* ophthalmia. For it is known, by experience, that there is a material difference between the effects of the opening of a natural or preternatural cavity of the animal body, spontaneously, or procured by caustic, and that made by the knife; since, in the two former, the consecutive symptoms are constantly milder than in the latter, or that of incision, independently of the spontaneous bursting of the *hypopion* through the cornea, being also not unfrequently followed by a discharge of the aqueous humor, and afterwards by a procidentia of the iris; and consequently the spontaneous rupture of the *hypopion* cannot in

* Richter says, in the same place, " Aliquando vero cum operationem, hypopii post ophthalmiam vehementem orti instituerem, accidit ut incisa cornea, et elapso humore aqueo, lens crystallina in cameram oculi anteriorem prolaberetur, et dilatatio [illegible] vulunsculo eximi ex oculo deberet.".

any respect serve as a rule in the treatment of this disease.

I know only one case in which the incision of the cornea, for giving issue to the matter of the *hypopion*, may be considered, not only as useful, but even necessary, that is, where the accumulation of coagulable lymph poured into the eye is so considerable, that from the excessive distension which it produces upon all the membranes of the eyeball, it occasions symptoms of such magnitude as to threaten, not only the complete destruction of the organ of vision, but also the patient's life, as I shall have occasion to shew towards the end of the chapter. This particular case, however, cannot serve as a model for the treatment of the common *hypopion*, or that which is most frequently met with in practice.

If it is certain besides, as it indubitably is, that blood extravasated in the eye, in consequence of any violence, and that even collections of membraneous flocculi of the *capsular* cataract, pushed by the point of the needle from the posterior into the anterior chamber of the aqueous humor, insensibly dissolve, and are, ultimately, entirely absorbed, as I shall prove in the chapter on cataract; and that the same thing happens to the *milky* or *caseous* cataract when broken down, and even to the crystalline lens itself deprived of its capsule and lodged in the vitreous humor by means of the operation; there is no cause to doubt that the same absorption can take place also in cases of collections of coagulable lymph, extravasated in the chambers of the aqueous humor, when the source from which the

glutinous humor is derived has been suppressed, and the power of the absorbing system of the eye at the same time restored.

It appears clearly from these facts, in my opinion, that the resolution of the *hypopion*, by means of absorption, including the five species into which this affection has been divided by Richter, forms the primary indication, which ought to direct the surgeon in the treatment of the disease. I have remarked, that in order to arrest the progress of this disorder, the only efficacious method is that of checking the violence of the inflammation, and shortening the *acute* stage of the ophthalmia, by the rigorous employment of the antiphlogistic treatment; or, in the case of *purulent* ophthalmia in its second stage, as I have remarked on that subject, of whatever species it may be, by astringent and repercussive applications. If this method of treatment succeed, as it does in the greater number of cases, the incipient collection of coagulable lymph poured into the bottom of the anterior chamber of the aqueous humor, not only ceases to augment, but in proportion as the ophthalmia disappears, the absorbent system takes up the heterogeneous humor, and the white or yellowish spot, of a crescent-like form, situated at the bottom of the anterior chamber of the eye, gradually diminishes, and ultimately disappears altogether. *Janin** considered an infusion of the flowers of the mallow applied upon the affected eye, as a specific solvent for the *hypopion*, but it is now well known that any external emollient application,

* Mémoires et observ. sur l'œil, sect. ix. page 405.

provided it be combined with the most exact and efficacious internal antiphlogistic treatment, in order to repress the *acute* stage of the violent ophthalmia, is productive of the same beneficial effect as the decoction of the flowers of mallows. Warm water alone is attended with the same advantage.

" A young woman," says the celebrated practitioner *Nannoni*, " was struck upon the eye with an ear of corn; in consequence of which it inflamed and produced a white matter, which presented itself behind the cornea, in the form of a crescent, without its being possible to determine whether it was contained in the laminæ of the cornea, or in the anterior chamber; whence I was asked, whether it could be evacuated by an incision; especially as the patient complained of great pain in the eye and forehead. I said, in the presence of Dr. Lulli and a number of surgical students, this patient being in the hospital, that the great pain which she complained of was not occasioned by the matter, but by the cause from which the matter originated. Which cause consisted in an inflammation that would be probably increased by giving a more free access to the external air than it has with the internal parts, where there is no external wound. By fomenting the eye and forehead with warm water, the inflammation ceased, and the matter disappeared; a circumstance which we have now so frequently observed to follow, that even in this instance, we may boast of the simplicity of the healing art."

Such indeed is the happy termination of the

hypopion, when the disease has been attended to from its commencement, and when the internal antiphlogistic treatment, and the emollient applications to the eye, speedily arrest and repress the *acute* stage of the violent ophthalmia. But it occasionally happens, either in consequence of the inflammatory period of the ophthalmia having more than usually resisted the means which are employed, or because they have been adopted too late, that the quantity of coagulable lymph poured into the eye, and collected in the chambers of the aqueous humor, is so considerable, that it continues for a long time, even after the acute stage of the ophthalmia has entirely ceased to obscure the eye, and intercept the vision. I have repeatedly seen patients, particularly in the lower class of people, as I have before observed, in whom the inflammatory stage of the violent ophthalmia having subsided very slowly, either from negligence or improper treatment, the anterior chamber of the aqueous humor has remained, for a long time, almost entirely filled with the viscid matter of the *hypopion*, which, in consequence of the inflammation having ceased, they have carried about almost with indifference, without complaining of any considerable pain, or inconvenience in the eye, except the difficulty of seeing with it. It is evident, that in this second stage of the ophthalmia, the dissolution of the *hypopion* can neither be obtained by the same means, nor with the same celerity, as in the first. For in the second stage of the ophthalmia, both on account of the quantity and density of the viscid matter effused, as well as of the atony of

the vascular system of the eye, it is not only necessary to allow nature time to effect a dissolution of it in the aqueous humor, and thereby dispose it to be insensibly absorbed along with this fluid, which is incessantly renewed; but also to invigorate the diminished power of the vascular system of the globe of the eye, particularly that of the absorbents, by artificial means; which must require more or less time, according to the age and constitution of the patient.

In the second stage of the violent *acute* ophthalmia, accompanied with *hypopion*, the surgeon's attention, therefore, should be confined to remove from the eye whatever may irritate it, or reproduce the inflammation in it; and he should only employ those means which may contribute to dissipate the second stage of the ophthalmia, arising from a laxity of the conjunctiva and its vessels, and to excite, at the same time, the action of the absorbents. Under these circumstances, therefore, he should, in the first place, carefully ascertain the degree of sensibility of the affected eye, by introducing between the eyelids and ball, some drops of the vitriolic collyrium, with mucilage of quince-seed; and if he should find that this application causes too great an irritation in the eye, he should immediately desist from it, and confine himself for some time to bags of tepid mallows, with the addition of a few grains of camphire, and at intervals the spirituous aromatic vapour mentioned in the chapter on ophthalmia, and the blister to the neck should be repeated. When the ex-

cessive morbid sensibility of the eye has ceased, he should return again to the use of the vitriolic collyrium, at first simple, but afterwards conjoined with a little camphorated spirit of wine. During this treatment, the surgeon will perceive, that in proportion as the *chronic* ophthalmia is dissipated, and the action of the absorbent system of the eye excited, the tenacious matter of the *hypopion* is first divided into several parts, or small masses; that it afterwards becomes more dilute, diminishes in quantity, and subsides towards the lower segment of the cornea, and ultimately disappears altogether.

The surgeon cannot always promise himself to obtain the same success in the treatment of the *hypopion*, whether the disease be in the first or second stage of the violent acute ophthalmia, when the tenacious lymph, which is rapidly poured into the eye, is in so considerable a quantity as not only to fill completely both the chambers of the aqueous humor, but also to distend them violently, and to produce considerable pressure, particularly upon the cornea. This unfortunate circumstance, notwithstanding the most effectual efforts of art, adapted to the peculiar state of the disease, is frequently followed by another accident of still greater magnitude than the *hypopion* itself, I mean the ulceration, opacity, and rupture of the cornea, either in its circumference or centre opposite the pupil; or in that part of it where there is the least resistance.

The proximate cause of this accident, is not so

much to be attributed to the acrid quality of the matter of the *hypopion*, as some pretend, as to the excessive degree of pressure which it makes upon the cornea from within outwards. Mr. John Hunter *, who has left us some important reflections upon this part of surgical pathology, has remarked, that extraneous substances lodged in any part of the animal body, although from their nature and figure not injurious, are continually determined and propelled by the powers of nature towards the surface of the body; and that the same, or even a less degree of pressure, which, applied to the animal body externally, does not produce ulceration of the skin, when directed from within outwards, excites in the part which is compressed, the ulcerative process, and that constantly from within, towards the surface of the body. The matter of the ciliary glands for instance, collected in large quantity, and distending the lachrymal sac, which might easily force a passage through the nasal canal, rather occasions by its distension the ulceration of the sac, while the same degree of pressure applied upon the external part of it, would certainly be insufficient to produce the same effect. Matter confined in the frontal sinuses rather occasions a corrosion of the bones and integuments of the forehead, by its pressure from within outwards, than forces its natural way into the nose. A musket-ball lodged among the muscles, in process of time is pushed, without any inconvenience, towards

* A Treatise on the Blood, Inflammation, and Gun-shot Wounds.

the surface of the body; but no sooner does it press upon the skin from within outwards, than it occasions it to ulcerate and open a passage for it. Precisely in the same manner, and in conformity with the same law, the coagulable lymph poured into the eye, forming the *hypopion*, is continually directed towards the cornea; and if this matter is in such quantity, as to press upon it from within outwards, beyond a certain degree not easily determinable, the texture of this membrane is immediately acted on by the absorbents, ulcerated and corroded.

When this happens, the ulceration of the cornea in general proceeds with such rapidity that the surgeon has seldom sufficient time to prevent it. And when the corrosion and rupture of the cornea has taken place in any part of it, the redundant quantity of coagulable lymph confined in the eye* begins to be discharged through this opening, with great relief to the patient. This advantage, however, is not of long duration; for when the glutinous humor, which distended the whole of the eye enormously, and particularly the cornea, is entirely, or in a great measure, evacuated, it is very frequently followed by a fold of the iris, which passes across the ulcer or fissure of the cornea; from which it projects externally, constituting the disease denominated the *procidentia* of the iris, of which I shall speak fully in the next chapter.

* It is on this account that this highest degree of the *hypopion*, is called, by the greater part of surgeons, the *empyema of the eye*.

If, under such urgent circumstances, the cornea already ulcerated, darkened, and in a great measure disorganized, is slow in bursting, the violence of the symptoms, which arise from the excessive distension of the eyeball, obliges the surgeon to make an artificial opening in it, in order to free the patient from the violent pain, as well as the danger of losing his life *, which may be executed with the less exactness, as, in these cases, he can scarcely reckon on the preservation of the sight. The acuteness of the pain in the eye and the whole head in these cases is so great that it very fre-

* Memoires de l'Acad. vol. xiii. 8. page 279. I passed some days in a garrison-town, where two sisters, ladies of quality, had, at the same time, the small-pox, one of them 20, the other 24 years of age: the variolous matter had been transferred to the eyes the pustules upon the whole of the body had dried, and no doubt would have been entertained of the happy termination of the disease, if the eyes had not been affected. Their tumefaction occasioned fever, violent pains, accompanied with heat and throbbing. Being called into consultation with several surgeons of the town, and two or three surgeon-majors of the garrison, I proposed to open the eyes in order to save the patient's lives. My advice was not relished; in vain I represented that these organs were irrecoverably lost; the strongest objection which was urged to me, was, that they had never heard of such an operation. A physician, in particular, thought it exceedingly strange that I should propose such a means; but the very speedy death of one of these ladies gave the parents some regret that they had yielded to the more general opinion. The other sister had the good fortune to escape, through the beneficence of nature; a spontaneous opening taking place, through which the matter formed between the tunics of the eye was evacuated. Her eyes preserved their globular form and natural size, but she remained blind, after having run the greatest risk of her life.

quently produces delirium, and excites an apprehension that the brain may be also affected by it.

If, after the evacuation of the tenacious humor, by means of the incision in the cornea, there were any hope of restoring to the patient, even in part, the transparency of this membrane, together with the action and use of the other parts, which constitute the principal organ of vision, it would be certainly prudent, that the surgeon should make the opening at the lower part of the cornea, as practised in the extraction of the cataract. But in the case of *empyema* of the eye, of which I am now treating, where the cornea is every where injured by the ulcerative process, opake, and ready to fall into a species of putridity, and where no hope can be entertained of being able to restore any part of it to its former transparency, the best method of speedily relieving the patient from the intolerable pain which he suffers, is to make an incision in the centre of the cornea to the extent of a line and a half with a small bistoury, then to raise the divided edge with the forceps, and remove it circularly with a stroke of the scissors, leaving in the centre of the cornea an aperture of the circumference of a lentil-seed.

Through this opening, the lips of which do not come in contact, like those of a simple incision, the most fluid part of the matter, which distended the eyeball, immediately escapes; the dense coagulable lymph, by little and little, takes the same route; then the crystalline, and in a few days afterwards

the vitreous humor also. It is very necessary, therefore, that the surgeon should abstain from compressing the eyeball strongly, in order to accelerate the evacuation of the vitreous humor, as experience proves that it is advantageous in these cases that this humor should be gradually and spontaneously discharged.

Immediately after the operation, the surgeon should cover the affected eye with a poultice of bread and milk, which should be renewed every two hours, not omitting the use of such general remedies as are calculated to check the *acute* inflammation, and quiet the disturbed state of the nervous system. In proportion as the suppuration takes place in the internal part of the eye, the eyeball diminishes, retires to the bottom of the orbit, and finally heals, allowing every advantage for the apposition of an artificial eye. From what has been advanced, therefore, it must be concluded that the division of the cornea is as necessary and useful in the case of *empyema* of the eye, accompanied with the very alarming symptoms abovementioned, and the irremediable opacity of the cornea, which is in a great measure disorganized, as it is contra-indicated and dangerous in the case of *hypopion*, which is most frequently met with in practice. Nor is the course which the surgeon ought to follow different from this where there is effusion of blood within the eye, in consequence of blows upon it or the surrounding parts. If the effused blood does not excite acute pain, and spasmodic tension at the bottom of the orbit, it is pro-

bable that absorption will take place, as in the case of *hypopion*, and it demands the same treatment. But if the quantity of grumous blood accumulated in the eye occasion very violent symptoms similar to those produced by *empyema*, it is absolutely necessary to make an incision in the cornea, as in the extraction of the crystalline, in order to give issue to it.

CASE XLII.

A strong country-woman, 35 years old, wa brought into the hospital towards the end of Apri 1796, on account of a violent *acute* ophthalmia in both her eyes, with which she had been afflicted three days, with great tumefaction of the eyelids, redness of the conjunctiva, acute pain, fever, and watchfulness. She was unable to assign any cause from which the disease had arisen.

I took away blood abundantly from the arm and foot, and also locally by means of leeches applied near both the angles of the eyes, and I also purged her. These remedies were attended with some advantage, in as much as they contributed to abate the inflammatory stage of the disease. Nevertheless an extravasation of yellowish glutinous lymph appeared in the anterior chamber of the aqueous humor, which filled about one third of that cavity.

By frequently washing the parts with the aqua malvæ made tepid, and the uninterrupted application of small bags of gauze filled with emollient

herbs boiled in milk, by diet, and repeated mild purges with a grain of the antimonium tartarizatum dissolved in a pint of the decoction of the root of the triticum repens, the symptoms of the ophthalmia were entirely relieved, and on the 11th day the patient was able to bear a moderate degree of light.

By persisting in the use of these emollient applications, the matter of the *hypopion* began to diminish, and by degrees, in the course of 12 days more, almost entirely disappeared. I now thought it proper to increase the strength of the local remedies, by introducing a few grains of camphire into the bags of mallows, which produced the best effect. For in less than a week the redness of the conjunctiva was entirely dissipated, as well as the small whitish line of a crescent-like figure, which had remained at the bottom of the cornea, depending upon the remaining part of the humor of the *hypopion*.

CASE XLIII.

Maddalena Bignani, the wife of a gardener, in the vicinity of Pavia, 40 years of age, of a delicate constitution, was seized with a violent *acute* ophthalmia in her left eye, which, notwithstanding some evacuations of blood, occasioned an *hypopion* in the anterior chamber of the aqueous humor, so that the cornea of that side appeared almost entirely obscured. The patient was admitted into the practical school on the 7th day from the attack

of the ophthalmia. She complained of acute and lancinating pain in the eye and corresponding temple.

I ordered leeches to be applied to the angles of the eyelids, and a gentle purge with two drams of crystals of tartar, and a grain of the tartarized antimony, in a pint of the decoction of the root of the triticum repens, to be taken in divided doses. A poultice of bread and milk with a little saffron was applied upon the eye. In four days the acute stage of the ophthalmia ceased, together with the lancinating pain in the eye and temple; but the *hypopion* continued stationary. Nothing more was now prescribed to the patient than food of easy digestion, and the application of bags of mallows upon the eye, to be renewed as often as they became cold. By this simple treatment the matter of the *hypopion*, which filled the greater part of the anterior chamber of the aqueous humor, began to be dissolved and absorbed; and in the course of 18 days, reckoning from the time of the cessation of the inflammatory stage of the ophthalmia, the pupil was clear.

Some of the tenacious matter yet remained at the bottom of the anterior chamber, and some redness of the conjunctiva, produced by the ophthalmia, from relaxation. I ordered a few grains of camphire to be added to the bags of mallows, which evidently contributed to accelerate the absorption, and in the space of 13 days, to clear the white of the eye. When the *hypopion* was entirely dissipated, the patient used with advantage a col-

lyrium, composed of the acetated ceruse dissolved in plantain water, with the addition of the mucilage of quince-seed, in order to give greater tone and strength to the conjunctiva and its vessels.

CASE XLIV.

A robust country-woman, 20 years of age, was struck upon the right eye with a piece of wood; a violent inflammation ensued, and afterwards an *hypopion*, which occupied about one half of the anterior chamber of the aqueous humor. There was also on the external and lower side of the cornea, and apparently at the part where she had been struck, a small ash-coloured and deep ulcer, of the circumference of a millet-seed, and the conjunctiva appeared excessively red and tumefied. The patient was admitted into the hospital the 5th day after the accident.

I ordered blood to be taken freely from the arm and foot, the bowels to be purged with small doses of the crystals of tartar, and the tartarized antimony, and a poultice of bread and milk, with saffron applied upon the eyelids.

On the 4th day from the patient's admission into the hospital, the inflammatory stage of the ophthalmia might be considered as having ceased, except that there was a slight pricking in the eye.

On the 6th day I found the patient more than usually tranquil. When the bag of gauze containing the poultice was raised, and the eye opened, I found the *hypopion* greatly diminished, and ob-

served a small drop of the tenacious matter ready to issue from the small ulcer upon the cornea, which, as I have remarked, had not been formed from within outwards, but from without inwards. I avoided every kind of pressure upon the eyeball, which might contribute to the too speedy evacuation of that humor, lest the iris should follow it. I continued to foment the eye with bags of emollient herbs until the whole of the matter of the *hypopion* was insensibly evacuated by this opening; which was completed in seven days. I now touched the ulcer with the argentum nitratum, so as to produce a deep and firm eschar. The acute pain which the patient felt, and the sudden increase of the redness of the conjunctiva, led me to fear a return of the inflammation; but by repeated ablutions with warm milk, and emollient applications, together with an opiate emulsion at night, she became perfectly easy. The eschar continued to adhere for four days. On its exfoliation, I touched the ulcer again with the argentum nitratum, and the symptoms were much less severe than the first time. On the separation of the second eschar, the bottom of the ulcer was filled with granulations, and had a tendency to heal. The vitriolic collyrium, with mucilage, employed for two weeks longer, was sufficient to complete the cure *.

* I might have extracted from my journal, a very extensive series of cases, similar to the three preceding, had I believed that a great number of histories, of the same kind, could have afforded a clearer elucidation of the method of treatment which I have

CASE XLV.

Mauro Spagnoli, a peasant, 60 years of age, was received into the practical school of surgery, the 20th of March 1793, who had one half of the anterior chamber of the aqueous humor of the left eye occupied by a collection of glutinous matter, which, according to his account, took place three weeks after a violent inflammation of that eye, which had been removed by bleeding and emollient applications. He did not complain of any remarkable pain in the affected eye, and could bear a moderate degree of light without repugnance. The conjunctiva was red from the relaxation of its vessels.

The great age of the patient, the small degree of sensibility of the eye, and the slow and almost imperceptible diminution of the *hypopion*, sufficiently indicated the necessity in this case of exciting the action of the absorbent system, and

recommended. I shall only observe that the *hypopion* in the first stage of the violent *acute* ophthalmia is rarely met with in the hospitals, as it is customary, particularly among the country people, to be copiously and repeatedly bled in inflammations of the eyes, and to employ diligently emollient cataplasms, with the hope of getting rid of the disease by these means, as it frequently happens. But in the case of *hypopion*, after the violence of the inflammation has ceased, they find, together with the extraneous matter poured into the anterior chamber of the aqueous humor, the vision obstructed; and it is at this period, although the disease does not cause considerable pain, that they come into the hospital, especially if they are advanced in age.

strengthening the vessels of the conjunctiva, in order to dissipate the collection of tenacious lymph poured into the anterior chamber of the aqueous humor. Instead of employing, therefore, the antiphlogistic method of treatment, and the emollient applications, as in the preceding cases, I ordered the patient a nourishing diet, proportioned to the strength of his stomach, and the decoction of cinchona to be taken three times a day in doses of three ounces. I directed the vitriolic collyrium, with the mucilage of quince-seed, to be instilled into the eye every two hours, and a blister to be applied to the neck. In eight days the *hypopion* was reduced to one half, and the conjunctiva had lost the dark red colour which it had at the commencement. The action of the collyrium was increased by adding a little camphorated spirit of wine to it; and in ten days more the *hypopion* disappeared altogether, as well as the *chronic* ophthalmia from relaxation.

CASE XLVI.

Giovanni Nuvola, a peasant, 45 years of age, a weak sickly man, labouring in the rice-fields, was struck upon the right eye with an ear of rice, with such violence, that his eye became inflamed the same day, and most acutely painful; and, in a few days after, a third part of the anterior chamber of the aqueous humor was filled with a tenacious yellowish lymph. The surgeon under whose care he was, bled him freely, purged him, and ordered

the eye to be assiduously fomented with an infusion of elder flowers and leaves of mallows.

On the 7th day, the inflammatory stage of the ophthalmia ceased, and the *hypopion* became stationary. The patient no longer felt any considerable uneasiness in the eye, and therefore kept it only defended from the air and light by means of a piece of linen suspended from his forehead. He now left the house, and attempted to pursue his labour in the fields; but finding that, two weeks after the inflammation had abated, the sight remained obstructed by this yellowish matter, he came to the hospital. The conjunctiva was affected with ophthalmia from relaxation, and the cornea, besides the opacity depending on the matter of the *hypopion*, was, in two points, slightly excoriated, as if the epidermis had been removed.

On account of the patient's general and local debility, I ordered him to take the cinchona, and to observe a nourishing and strengthening diet, and to use the vitriolic collyrium externally every two hours, which he could not bear unless warmed. In a few days the vessels of the conjunctiva recovered their former vigour, and the *chronic* ophthalmia disappeared. The *hypopion* also gradually diminished, and in fifteen days, the cornea having recovered its natural state of transparency, the patient used the ophthalmic ointment of Janin for a few times only at night, and then left the hospital perfectly cured.

CASE XLVII.

Filippo Saletta, a miller, of Calignano, 56 years of age, was received into the practical school of surgery, on the 26th of December 1794, on account of an *hypopion* which occupied two thirds of the anterior chamber of the aqueous humor of the right eye. The blood-vessels of the conjunctiva were very much dilated and varicose, the eyelids gummed, and there were superficial excoriations in some points of the cornea. He did not, however, complain of much pain in the eye, and exposed himself freely to the light. He related that at the commencement of the disease, which had continued for a month, he had found relief from being bled; but that afterwards, notwithstanding the application of warm fomentations of mallow-water, the disease had remained nearly in the same state as a few days after the bleeding.

I directed the patient in this case, as in a great variety of others similar to it, to take two drams of the cinchona three times a day, and to observe a strengthening animal diet. Externally, I ordered the vitriolic collyrium, composed of five grains of the vitriolated zinc, four ounces of plantain water, and half an ounce of the mucilage of quince-seed, to be dropped into the eye every two hours. And as the eye appeared very little sensible to the stimulant and astringent action of this remedy, a small quantity of camphorated spirit of wine was added

to it. In 18 days, the *hypopion*, as well as the *chronic* ophthalmia, from relaxation, disappeared. In order to strengthen the part, and correct the morbid secretion of gum, the ophthalmic ointment of JANIN * was afterwards introduced morning and evening, between the eyelids of the affected eye, and continued for 12 days.

* With regard to this remedy, I ought again to caution the young surgeon not to use it at first, except with a larger quantity of lard than is directed in the formula; otherwise it generally occasions too much irritation, and instead of being useful is injurious.

CHAP. XIV.

OF THE PROCIDENTIA IRIDIS.

THE *iris* preserves its natural position, and is kept at a proper distance from the cornea, as long as the humors which fill the cavity of the eye, in which it is immersed and suspended, remain in perfect equilibrium with each other, during which this body, although of the most delicate and distensile texture, contracts or relaxes itself without forming any unnatural fold. But if, after the effusion of the aqueous humor, in consequence of any accidental or artificial opening in the cornea, the pressure made by the humors of the eye behind the *iris*, is not balanced by the fluid contained in the anterior chamber, the *iris* is necessarily pushed forwards by little and little towards the cornea, and is in part gradually forced out of the eye, through the opening by which the aqueous humor was evacuated. Hence, under such circumstances, a small tumor is formed upon the cornea, of the peculiar colour of the *iris*, which, by the greater part of surgeons, is termed *staphyloma* of the *iris*, but which I have thought proper to call with GALEN* *Procidentia*

* *De differentiis morborum*, class. III. cap. 15. Contingit vero nonnunquam, ut tunica cornea appellata profundum habeat

Iridis, in order to distinguish it from another disease to which the word *staphyloma* more particularly applies.

The *procidentia iridis* is occasioned by wounds and ulcers of the cornea, penetrating to some extent into the anterior chamber of the aqueous humor, and also by violent contusions of the eye-ball, with rupture of the cornea. If, immediately after an accidental or artificial wound of the cornea, as that which is made in the extraction of the cataract, or for the purpose of evacuating the matter of the *hypopion*, as is practised by some, the lips of the wound do not immediately return into mutual contact, and are not maintained in sufficient union to prevent the aqueous humor in proportion as it is renewed from flowing out of the anterior chamber; the *iris* being drawn along by the current of the aqueous humor, which is incessantly directed towards the wound in the cornea, insinuates itself between the lips of the wound, elongates, and a portion of it is by degrees protruded, and projects upon the cornea in the form of a small tumor. The same thing takes place when there is a recent wound of the cornea, and the eyeball is unfortunately struck, or too much compressed by the bandage; or the patient is

ulcus, qua deinceps excisa tota, aliquid ex ea tunica *procidit*, quæ secunda post corneam ordine sita est, uvea appellata, et ipsa pupillæ una divulsionem patiatur. Atque ex his tribus quælibet passio oculi existimatur: quodvis ulcus et erosio ad solam corneam pertinet, *procidentia* ad uveam, et divulsio ad pupillam.

Et tunica uvea, ut plurimum, relaxatur, cum corneam nimium erodi contigerit. *De causs. morbor. class* III. cap. 10.

seized with a spasm of the muscles of the eye, with excessive and repeated vomiting, or with violent and frequent fits of coughing. This disease is still more frequently the consequence of ulcers penetrating into the anterior chamber of the aqueous humor, than of wounds of the cornea, inasmuch as the solution of continuity in this part, in consequence of ulceration, is accompanied with loss of substance, and the lips of the ulcer do not admit of being placed in mutual contact, in a membrane so tense and compact as the cornea. The small tumor is necessarily of the colour of the *iris*, that is, brown or grey, and is surrounded at its base by a small opake circle* of the cornea, which is ulcerated, or has been for some time divided.

As the cornea is in general only perforated in one part of its circumference, whether in consequence of wound or ulcer, so most frequently there is only one *procidentia* of the *iris* met with in the same eye. But if it happen that the cornea has been wounded or eroded in several distinct places, more protrusions of the iris take place in consequence of them in the same eye, and there are as many small tumors projecting upon the surface of the cornea as there are apertures. I have seen a case in which there were three distinct *procidentiæ* of the *iris* upon the same eye, in consequence of three separate ulcers penetrating into the anterior chamber of the aqueous humor, one of these being situated in the upper, and two in the lower segment of the cornea.

* Plate II. fig. 6.

If we consider for a moment the delicate struc-ture of this membrane, the great number of blood-vessels with which it is supplied, the numerous filaments of nerves which are directed towards it, as to a common centre, and distributed upon it, it is easy to conclude how violent the symptoms which usually accompany this disease must be, although the portion of the *iris* projecting out of the cornea be small, and not larger than the head of a fly. The harsh and repeated friction to which this delicate membrane is exposed, from the motion of the eyelids, from the access of the air, of tears, and of matter, are sufficient causes of continual and inevitable irritation. Added to this, that the portion of the *iris*, which is protruded, in consequence of the increased afflux of blood towards the part most irritated, acquires shortly after its appearance a larger size than at the time when it was forced out of the cornea; on which account it is more compressed and irritated a little after its appearance out of the cornea, than before. In the commencement of the disease, the patient complains of a pain, as if a thorn were fixed in the eye; this is afterwards accompanied with an uneasy sense of tightness or constriction of the eyeball, which is succeeded by an inflammation of the conjunctiva and eyelids, a discharge of scalding tears, and a complete aversion to the light. And as the protruded fold of the *iris* draws the rest of the same membrane towards that part, the pupil, from mechanical necessity, assumes an oval figure*, and is removed

* Plate II. fig. 6.

from the centre of the *iris* towards the seat of the protrusion. The intensity of the pain, inflammation, and other symptoms which accompany the *procidentia iridis*, do not, however, always continue to increase; for cases are very frequently met with in practice of long standing, in which the disease having been left to itself, the pain and inflammation have spontaneously ceased, and the tumor formed by the *iris* has become almost entirely insensible. I lately saw a man, 50 years of age, who had a *procidentia* of the *iris*, during 10 weeks, in the right eye, of twice the size of a millet-seed, which he bore with the greatest indifference, and without any other inconvenience, than a little chronic redness of the conjunctiva, and difficulty of moving the eyeball freely, in consequence of the friction which the lower eyelid made against the projecting portion of the *iris*. When the small tumor was touched with the point of the finger, it felt hard and almost callous. This circumstance arises partly from the constriction, which, after some time, the lips of the wound, or ulcer, make around the base of the protruded portion of the iris, in consequence of which it is deprived of its natural exquisite sensibility; and partly in consequence of this delicate membrane losing its vitality, from the induration and callosity induced upon it, by its long exposure to the air, and tears.

With respect to the treatment of the disease in its commencement, some recommend that the *iris* should be pushed back into its situation by means of a whalebone probe, and if there should be any difficulty in this, that even the wound or

ulcer of the cornea should be dilated, by making an incision of a sufficient length, in the same manner as in the reduction of the strangulated intestinal hernia. Others advise, that the portion of the *iris* projecting from the eye should be merely irritated, in order that it may contract and retire; or that the affected eye should be suddenly exposed to a very vivid light, from a hope, that by the forcible contraction of the pupil, the fold of the *iris* confined between the lips of the wound or ulcer of the cornea, may return to its position. Experience, however, has clearly proved, that all these methods are absolutely useless, if not dangerous. For, supposing it were possible, by any of these methods, to replace the *iris* in its situation, without tearing or injuring it in any manner, as a passage would always remain open for the aqueous humor through the wound, or ulcer of the cornea, as at first, the *iris*, when replaced, would descend immediately afterwards, and protrude through the cornea, as it did previously to the operation.

It cannot be denied that the *procidentia iridis* is a serious accident. But whoever considers that we are not at present in possession of any means capable of instantly suppressing, or even of suspending, the discharge of the aqueous humor through the wound, and much less through an ulcer of the cornea, when either of these exceed certain limits, will find that in circumstances so unfavourable, the *procidentia* of the *iris*, instead of being a disease, is rather a fortunate occurrence, and perhaps the only one which could prevent the

complete destruction of the organ of vision. For the fold of the *iris*, by insinuating itself in the form of a plug, between the lips of the wound, or ulcer of the cornea, puts a stop to the complete evacuation of the aqueous humor, which by being speedily collected anew in the anterior chamber, and no longer able to flow through the cornea, prevents the further protrusion of the *iris*, separates the rest of this membrane from the cornea, and by restoring the equilibrium between it and the other humors of the eye, prevents the total destruction of that organ. This being evident, it must be obvious, that any of those methods hitherto proposed for pushing back the *procidentia iridis*. can only be, as I have said, useless or dangerous.

Consistently with these principles, there are two principal indications which the surgeon ought to fulfil in the treatment of the *procidentia iridis*, when it is recent; the one is, that of allaying the highly exquisite sensibility of the projecting portion of the *iris*; the other, of gradually destroying it to such a depth on this side the cornea, that without taking away the adhesion which it has contracted with the bottom of the wound, on the side next the anterior chamber of the aqueous humor, it may not keep the external lips of the wound, or ulcer, immoderately separated, and thereby prevent their healing.

Nothing answers these two indications better, than touching the portion of the *iris*, projecting out of the cornea, with the antimonium muriatum, or, what is more commodious and expeditious,

with the argentum nitratum, so as to produce an eschar of sufficient depth. And, in order that this may be executed promptly, and with exactness, it is necessary that an assistant placed behind the patient's head, should keep the upper eyelid suspended by means of the elevator of PELLIER; and the patient, if he has attained the age of reason, should hold the eyeball steady, by fixing it attentively upon one object. While the assistant gently raises the upper eyelid, the surgeon should depress the lower with the fore and middle finger of his left hand, and with his right expeditiously touch the small tumor formed by the *iris*, with the argentum nitratum, cut in the form of a *crayon*, and press it upon the centre of the protruded portion, so as to produce an eschar of a proper depth. The pain which the patient feels at the moment is very acute; but by immediately washing the eye with warm milk, it quickly ceases. The caustic speedily destroys the sensibility of the protruded portion of iris, and by producing a sufficiently deep eschar, defends it from the friction of the eyelids, and the contact of the air and tears. And it is precisely on this account, that after the cauterization, the sense of pricking and constriction of the eye, of which patients so much complain, is not only relieved, but the inflammation also is considerably diminished, together with the copious discharge of scalding tears.

These advantages, as in the case of ulceration of the cornea, continue precisely as long as the eschar adheres to the small tumor formed by the iris. On its exfoliation, which sometimes takes

place on the second, sometimes on the third day from the cauterization, all the symptoms above enumerated return; with this difference, that they are less intense and acute than before, and the small tumor of the *iris* is less elevated upon the cornea, than it was before the application of the caustic. On the re-appearance of these symptoms, the surgeon should again have recourse to the argentum nitratum, with the cautions already delivered, and he should repeat it a third or fourth time if necessary, or, until the protruded portion of the *iris* be sufficiently depressed below the level of the external lips of the wound, or ulcer of the cornea, so as to be no longer an obstacle to their granulation and cicatrization.

It may be advantageous to repeat here what has been said on the treatment of deep ulcers of the cornea. There is, as it has been remarked, when treating on ulcers of the cornea, a certain point beyond which the application of the caustic, at first highly useful, becomes exceedingly injurious, and the eschar which before allayed the pain afterwards aggravates it, and causes the inflammation to return, with nearly the same violence as at the commencement of the disease. This takes place, according to my observation, whenever the surgeon continues to apply the caustic, after the small tumor formed by the *iris* has been destroyed, below the level of the external lips of the wound, or ulcer of the cornea, and the caustic tends to destroy the granulation which has already commenced. In the treatment of this disease, therefore, as soon as the surgeon perceives that the projecting portion

of the *iris* is sufficiently depressed, and that the application of the caustic, instead of relieving, aggravates the disease, he should entirely desist from the use of it, and merely introduce between the eyelids, every two hours, the vitriolic collyrium with mucilage of quince-seed, or that composed of the vitriolated zinc, and the white of an egg; and afterwards, he should employ also the ophthalmic ointment of JANIN, morning and evening, lowered by a double or triple quantity of lard. If the stimulus produced by these applications does not disturb the process of nature, the ulcer will be constantly found to contract itself by little and little, and in the course of a fortnight to be completely cicatrized. Cases, undoubtedly, are sometimes met with, in which the extent of the ulcer, and the size of the tubercle, formed by the projecting portion of the *iris*, are such as to render the extensive application of the argentum nitratum not only insupportable, but useless; the *procidentia* of the *iris*, after the detachment of the eschar, being found nearly as large as before, and the eye much more highly irritated and painful. In these instances it is better to desist from the application of the argentum nitratum, and to use no other topical remedy than the ointment of JANIN, morning and evening; from which experience has taught me, that though in such cases the cure is of longer duration than when the caustic can be employed, yet, finally, it is obtained in the most perfect manner, and with the least possible uneasiness to the patient.

The adhesion which the protruded portion of the

iris contracts during the treatment, with the internal lips of the wound, or ulcer of the cornea, continues the same after the formation of the external cicatrix, and consequently during the rest of the patient's life. The pupil, therefore, even after the most successful treatment of the *procidentia iridis*, is found a little inclined towards the cicatrix of the cornea, and of an oval figure. This change in the situation and figure of the pupil, however, diminishes very little, if at all, the power of distinguishing, even the most minute objects, and injures the vision much less than might naturally be expected; provided the cicatrix of the cornea is not too extensive, and situated precisely opposite the centre of the cornea. And, in the first case, the vision is still less impeded by it, as the pupil, which, at the commencement of the disease, was narrow and oblong, and very much drawn towards the wound or ulcer, gradually enlarges after the formation of the cicatrix, and in the course of time, forms an oval less compressed*, and in some measure tends to occupy the situation which it formerly had towards the centre of the *iris*. This fact has been also remarked by RICHTER †.

The method of treating the *procidentia iridis*,

* Plate II. fig. 7.

† Observ. chirurg. fascicul. I. page 80. Omni tamen plerumque hoc vitium periculo, vel damno caret, partim cum raro visui obsit, partim quia sponte plerumque pristinam suam figuram pupillæ induit, citius quidem aliquando, interdum vero tardius. Minor pupilla sensim latior fit, oblonga fit rotunda, deorsum tracta sensim ad pristinum locum ascendit; atque hæc omnia sponte plerumque fiunt.

here recommended, is that which I have found more certain and useful than any other which has been yet proposed, not excluding that of removing the small tumor formed by the *iris* beyond the surface of the cornea, by a stroke of the scissors.

If the perfect success of the excision corresponded in all cases to what some have promised, nothing would unquestionably contribute more to the speediness of the cure of the *procidentia* of the *iris*, than such an operation. But I am convinced, from experience, that this method can only be executed with the hope of perfect success, in that individual case, in which the *iris* has contracted a strong adhesion to the internal lips of the wound, or ulcer of the cornea; and more particularly in that *procidentia* of the *iris* of long standing, in which the protruded portion has become in time nearly insensible, hard, and callous, and where its base being strangulated between the lips of the wound, or ulcer of the cornea, has not only contracted an adhesion with them, but has also assumed the form of a fine peduncle *. Under these circumstances, the excision of the inveterate *procidentia* of the *iris* is useful, and exempt from all danger, since the prominent portion of it, which has now formed an adhesion internally to the ulcerated edges of the cornea, being removed by a stroke of the scissors, on a level with the external lips of the ulcer, there is no risk of renewing the effusion of the aqueous humor, or of giving room to the protrusion of any

* I have seen a case, in which the small tumor of the *iris*, from being long compressed between the edges of the ulcer of the cornea, ultimately fell off spontaneously.

other portion of the *iris;* and one or two applications of the caustic afterwards are sufficient to excite the process of granulation, and heal the ulcer of the cornea. But this is not the case in the recent *procidentia iridis*, which has not yet contracted an adhesion to the internal lips of the wound, or ulcer of the cornea. In four subjects affected with recent *procidentia iridis*, after having extirpated the protruded portion of the *iris*, of the size of the head of a fly, with the curved scissors, although I touched the divided part, as well as the lips of the ulcer of the cornea, immediately afterwards, with the argentum nitratum, I found the next day, not without regret, that another portion of it, of the same size as the first, had made its way through the ulcer of the cornea, and that the pupil, which was exceedingly contracted in it, approached still nearer the ulcer of the cornea. I had, therefore, reason to fear, that if I had persisted in removing the small tumor a second time, the protrusion of the *iris* would have returned again in a greater degree, and with further diminution of the pupil; I therefore contented myself after the first experiment, with treating the disease by the caustic, in the manner before recommended; which was attended, in all the four cases now mentioned, with success, except that the pupil having been too much drawn towards the ulcer of the cornea, remained covered more than usual by the cicatrix.

Before I finish this chapter, I shall take an opportunity of directing the attention of surgeons to a particular species of *procidentia*, much less frequent indeed than that of the *iris*, but which, how-

ever, is occasionally met with in practice, to which modern oculists have improperly, in my opinion, given the name of the *procidentia of the tunic of the aqueous humor**.

This disease consists in a small pellucid vesicle, full of water, formed by a very fine membrane, which protrudes from the wound, or ulcer of the cornea, nearly in the same manner as the *iris* does under similar circumstances. I have frequently seen this vesicle, full of water, projecting out of the cornea a little after the extraction of the cataract, and sometimes also in cases of ulcer of the cornea, particularly after the excision of the prolapsed *iris*.

Oculists are, for the most part, of opinion, that this small pellucid tumor is formed by that subtle, elastic, transparent membrane, which invests the cornea internally, and which has been described by DESCEMET and DEMOURS. As soon, say they, as the division or erosion of the cornea has exposed the thin membrane which lines its internal surface, this pellicle being unable to resist the impulse of the humors which press upon it, from behind, forwards, must of necessity insensibly yield, elongate, and ultimately project out of the wound or ulcer of the cornea, precisely in the form of a small pellucid vesicle. But how remote this opinion is from the truth, must appear to any one who will for a moment reflect upon the following circumstances. In the first place, the fine and elastic pellicle, described by DESCEMET and DEMOURS, cannot

* Chute de la tunique de l'humeur aqueuse. See Janin, Pellier, Guerin, Gleize, &c, &c.

be separated by any artificial means from the internal surface of the cornea, except near the part where the sclerotica and cornea unite, and as *vesicular procidentiæ* are met with in every part of the cornea, and in the very centre of it, where this pellicle is not separable and distinct from the compact texture of the cornea; it must at least be admitted, that the tunic of the aqueous humor is not always that which constitutes the disease here spoken of. 2dly, It is an admitted fact, that this *vesicular procidentia* more frequently happens after the extraction of the cataract, than on any other occasion; in which case, as the tunic of the aqueous humor must certainly have been divided, to allow of the passage of the crystalline lens, it cannot be supposed that the pellucid *vesicle* which projects from the cornea, after this operation, ought to be referred to the distension or protrusion of the tunic of the aqueous humor. 3dly, If, in cases of ulcer of the cornea, the minute *vesicle* sometimes appears after the excision of the prolapsed *iris*, it is clear, that if it were formed by the tunic of the aqueous humor, it ought constantly to appear before that disease. 4thly, If the surgeon remove this *vesicular* body, by a stroke of the scissors, on a level with the cornea, a small quantity of limpid fluid is observed to spurt out in the act of dividing it, without the aqueous humor of the anterior chamber being evacuated; an occurrence which would be inevitable, if the *vesicle* were formed by the fine elastic pellicle which is said to invest the cornea internally. Besides, although the small pellucid tumor be taken away by excision, yet it very fre-

quently happens, that the next day another, exactly similar to that which has been removed, is found in the same place. Now, if this small tumor were formed by the tunic of the aqueous humor, protruding through the wound or ulcer, it could not be reproduced, as it is, at least in the same part of the cornea. These considerations have satisfied me, that what has been commonly imagined to be a *procidentia of the tunic of the aqueous humor*, is in reality nothing more than the protrusion of a portion of the vitreous humor, which, after the extraction of the cataract, either from the too violent compression made upon the eyeball, during or after the operation, or from the spasmodic action of the muscles, insinuates itself between the lips of the wound of the cornea, and appears externally, in the form now described *.

The same thing happens likewise in the case of ulcer of the cornea, when the aqueous humor being evacuated, a powerful compression has forced a portion of the vitreous humor towards the ulcer situated opposite the pupil; or when the prolapsed portion of the *iris* being extirpated, a process of the vitreous humor has directly insinuated itself between the edges of the ulcer in the cornea, without having passed through the pupil. Hence it is evident why the small pellucid body is formed in both cases, although the tunic of the aqueous humor has

* Mr. Ware thought that this *vesicle* might be formed by the mucus transuding from the wound in the cornea; and in another place suspected, that this arose from a defect of union between the internal and external margins of the wound. *See notes to Wenzel's Treatise on the Cataract.*

been divided or destroyed by the ulcer, and why, even after the *vesicle* has been removed on a level with the cornea, it very frequently re-appears in the same place; it is because one or more cells of the vitreous humor forming it being removed, other cells of the same humor filled with limpid fluid enter in succession between the lips of the wound, or ulcer of the cornea, in the place of the first.

The treatment of this species of *procidentia* consists in removing by excision the small pellucid *vesicle* which emerges from the wound or ulcer, and in replacing the lips of the wound of the cornea in perfect contact immediately afterwards, in order that they may unite as exactly as possible. But in the case of ulcer of the cornea, immediately after the removal of the *vesicle*, the ulcer ought to be touched with the argentum nitratum; and in such a manner that the eschar produced by the caustic, may resist a fresh escape of the vitreous humor, and the ulcerated part be at the same time disposed to granulate and heal.

In this species of *procidentia*, that which projects from the cornea being merely a fine membrane filled with water, and entirely destitute of sensibility, its separation from the parts contained in the eye is of very little importance; while, on the contrary, by its presence, it produces all the disadvantages of any extraneous body which might oppose the union of a wound, or the granulation and healing of an ulcer. The division of this *vesicular* body, therefore, is clearly indicated, and experience confirms the success of it. In general it is speedily removed by a stroke of the curved scissors;

but if in any particular case the tumor should not project sufficiently out of the wound or ulcer to be included by the scissors, the intention may be obtained by pricking it with the point of a lancet or cataract needle; for the limpid fluid which it contains being discharged, the membrane of which it is formed retires within the lips of the wound, or ulcer of the cornea, and is no longer an obstacle to the approximation of the former, or the cauterization of the latter.

If it should happen that the day after the excision or puncture, the small pellucid tumor should re-appear in the same part as before, it will be necessary to repeat the operation, and to take further measures to keep the wound of the cornea in contact; or if there be an ulcer, to make the eschar adhere more firmly to the bottom and sides of it, and present a more powerful barrier than before to the escape of the vitreous humor. In such cases, therefore, the surgeon should guard against every thing with the greatest possible care, which might press the vitreous humor towards the wound, or ulcer of the cornea, and particularly the too violent compression of the eyelids, spasm of the muscles of the eye, cough, sneezing, costiveness, and other similar causes, at the same time taking care to prevent the progress of the inflammation.

Upon the treatment of this species of pellucid *vesicular procidentia*, the two cases of Pellier * deserve to be read, to which, if further proofs were necessary, I might add several others similar to

* Observ. sur l'œil, p. 350. Observ. 99, 100.

them, which I have met with in consequence of ulcer of the cornea, penetrating into the anterior chamber of the aqueous humor; the success of which has been as complete as in the two cases described by the French oculist.

Lastly, the *procidentia* is a disease from which the *choroid* coat is not wholly exempt; I have seen and treated this accident, in the person of Signor Giovanni Bressanini, an apothecary of Bescapè. In consequence of a violent *acute* internal and external ophthalmia, which was treated at the beginning with repellents, a small abscess formed between the sclerotic and choroid coats, at the distance of two lines from the junction of the cornea with the sclerotica, on the inferior hemisphere of the eyeball. The small abscess burst, and discharged a little dense and tenacious lymph; a small blackish body afterwards protruded from this ulcer of the sclerotica, which was formed by the choroid coat. The treatment consisted in repeatedly touching this prominent portion of the choroid coat with the argentum nitratum, until it was destroyed, and reduced to a level with the bottom of the ulcer of the sclerotic coat; after which the ulcer healed. The eye remained, however, very weak, and the pupil afterwards contracted, so as to be almost entirely closed.

CASE XLVIII.

Angiola Maria Porta, a robust country-woman, 30 years of age, after having been afflicted with a wandering gout, was attacked with a violent *acute*

ophthalmia in the right eye, which occasioned the formation of an *hypopion*, and afterwards an ulcer of the cornea, with a *procidentia iridis*, of the size of a fly's head, accompanied with very acute pain in the eye, and a discharge of scalding tears.

The patient was admitted into the hospital on the 25th of May, 1795. The small ulcer was immediately cauterized with the argentum nitratum, and in a few minutes the woman found her pain greatly relieved. As the eschar did not adhere to the small tumor longer than twenty-four hours, I continued to apply the caustic to it every day until the 8th of June; that is, until the protruded portion of the *iris* was destroyed beyond the external lips of the ulcer of the cornea. Afterwards, I employed the ophthalmic ointment of Janin for the space of fifteen days, in which time the ulcer was perfectly healed.

CASE XLIX.

Giuseppe Borghi, of Pavia, a boy 9 years old, was brought into the practical school on the 22d of January, 1796, on account of a *procidentia* of the *iris*, of the size of a small lentil-seed, which had formed itself through an ulcer situate on the lateral and external part of the cornea of the right eye, accompanied with *chronic* ophthalmia, edematose swelling of the eyelids of that side, and excoriation of the tarsi; to all which evils the poor child had been long abandoned by the excessive negligence of his parents. Although he could not

bear the light with the right eye, he gave no signs of pain when the small tumor, formed by the *iris*, was touched with the point of a probe, in consequence of this protruded portion being in some measure callous.

The part was touched every day, for a week, with the argentum nitratum; as the eschar produced upon it did not adhere longer than twenty-four hours. At the end of this time, the *procidentia* of the *iris* was destroyed as far as the bottom of the ulcer of the cornea. On account of the swelling and determination to the eyelids, I directed, in the mean time, a seton to be put in the neck, and purged him frequently with the tincture of rhubarb. In order to accelerate the healing of the ulcer of the cornea, after the protuberant portion of the *iris* was destroyed, as well as to remove the excoriations of the tarsi, I employed the ophthalmic ointment of Janin, morning and evening, and during the day the vitriolic collyrium with mucilage. In twenty-six days the boy was perfectly cured, as he could distinguish with this eye the most minute objects; the pupil, however, preserved an oval figure.

CASE L.

A. Catterina Cartosi, an inhabitant of Valeggio, aged 21 years, a weak and thin woman, in attempting, on the 20th of March, 1797, to break a piece of wood, by bending it against her knee, a splinter struck the left eye, which divided the lateral and

external part of the cornea perpendicularly. The *iris* situated behind passed through this fissure, and appeared externally in the form of a blackish line, projecting upon the cornea in the direction from above downwards. The eye inflamed greatly, and it was not till the eighth day from the accident that she was brought to the hospital, after having been bled.

The acute pain in the eye continuing, I directed a bread and milk poultice to be applied, which gave her relief. I afterwards proceeded to touch this prominent line, formed by the *iris*, with the argentum nitratum. The eschar separated a few hours afterwards, and the pain in the eye, therefore, returned as acutely as before, on which account, I was under the necessity of giving the patient at night an opiate draught. I repeated the application of the caustic for three successive days; which was sufficient to destroy the dark line, formed by the *iris*, projecting upon the cornea. The ophthalmic ointment of Janin was afterwards used morning and evening, reduced by a double quantity of lard; by the action of which remedy the ulcer of the cornea contracted and healed, in the direction from the upper to the lower part of the fissure. The lower extremity of the wound, however, remained stationary, on account of the small portion of the *iris* corresponding to that part, not being destroyed to a sufficient depth below the external lips of the ulcer of the cornea. I therefore touched this part with the caustic twice in the space of three days; and afterwards applied

the ophthalmic ointment, by which it was completely healed. As the perpendicular spot remaining upon the cornea, in consequence of the cicatrix, was situate on one side of the pupil, and as the latter being drawn towards the cicatrix, allowed a sufficient opening for the passage of the light, it did not prevent the woman from recovering the sight of the eye.

CASE LI.

Signor Mauro R——, of Pavia, 40 years of age, a thin man, in the month of August, 1795, accidentally received a stroke with the lash of a whip in the external angle of the left eye, precisely at the junction of the cornea with the sclerotica. The violent contusion occasioned an inflammation of the whole eye, and a small tumor at this part, which shortly afterwards burst, and allowed a quantity of the aqueous humor to pass out, and after it a small portion of the *iris*, of the size of two millet-seeds put together. The relaxation of the conjunctiva near to it, and the turgescency of its vessels, formed an elevation in the external angle of the eye, which, in the form of a valve, covered a part of the *procidentia iridis*. It was particularly worthy of remark, that, although the pupil was of an oblong figure, as in all other similar cases, it appeared more dilated than that of the sound eye.

Two weeks had passed from the time of the formation of the *procidentia iridis*, before the patient

consulted me. He did not at this time complain of much pain in the eye, and notwithstanding the disease, frequently went out of the house to attend to his affairs.

I ordered that the projecting portion of the *iris* should be touched with the argentum nitratum; which was repeatedly executed, until the whole of it disappeared, and the ulcer was disposed to heal; which was accomplished in eighteen days. The vitriolic collyrium, employed for two weeks more, completed the cure, the ulcer of the cornea being perfectly healed, and the vessels of the conjunctiva restored to their former vigour. The pupil remained, as usual, of an oval figure, but from a singularity, which I have not met with in any other instance, continued, as at the commencement of the disease, more dilated than that of the sound eye; on this account, after the patient was cured of the *procidentia iridis*, he saw better in the dark with the left than with the right eye.

CASE LII.

A postillion, 20 years of age, afflicted from his infancy with scrofulous tumors in the neck, and with ophthalmia, was attacked with a violent inflammation of the right eye, which occasioned an abscess and ulcer of the cornea, and afterwards a *procidentia iridis* of the size of a small lentil-seed. At the time I saw him, which was five days from the appearance of the *procidentia*, he complained

exceedingly on the slightest motion of the eyelids. The cure was undertaken on the 11th of January, 1792, by touching the small tumor, formed by the *iris*, with the argentum nitratum, and endeavouring to produce a deep eschar upon, and within it.

When the eschar was detached, the caustic was again applied and repeated, five times in the course of nine days, carefully washing the eye each time with warm milk. At this period, the portion of the *iris*, which protruded through the ulcer of the cornea, was destroyed, and reduced below the level of the external lips of the ulcer. I now confined myself to the application of the vitriolic collyrium, which was dropped into the affected eye every two hours, by which, on the 30th of the same month, the ulcer was perfectly healed. The pupil appeared of an oval figure, but this was not attended with any defect of vision.

CASE LIII.

Giuseppe Gaggi, of Pavia, a robust man, much addicted to wine, being rendered nearly blind by an obstinate *chronic* ophthalmia, which had continued forty days with *procidentia* of the *iris*, was brought into the practical school of surgery on the 6th of November, 1795.

There were two distinct *procidentiæ* of the *iris*, each the size of a millet-seed, situate upon the inferior hemisphere of the cornea of the left eye,

and to complete his misfortune, the cornea itself was rendered completely opake by a dense *nebula.* Upon the upper hemisphere of the cornea of the right eye, there was also a *procidentia* of the *iris*, the size of the head of a fly, but in every other part it preserved its natural transparency. The patient complained of intense heat in the eyes, but not of acute pain.

On the 6th, 7th, and 9th of November, the prolapsus of the *iris* of the left, as well as of the right eye, was touched with the argentum nitratum, and a deep eschar was produced, which, however, did not excite much pain.

On the 10th the eschar of the right side separated, and the *procidentia* of the *iris* was found very much diminished.

On the 18th, after three more applications of the caustic, the two *procidentiæ* of the *iris* of the left eye also were reduced to a level with the ulcers of the cornea. Being desirous, in this state of things, to stimulate the edges of the ulcers a little by another application of the argentum nitratum, the patient made some unusual contortions, and gave signs of acute pain; to relieve which, it was necessary to wash the eyes frequently with warm milk, and to cover them at night with a poultice of bread and milk. This sufficiently indicated the necessity of desisting from the use of the caustic. When the last eschar was detached, I therefore confined myself to the use of the vitriolic collyrium, which was introduced every two hours.

On the 13th of December, the patient being perfectly cured of the *procidentiæ* of the *iris*, and ulcers of the cornea, went into the convalescent ward. The ophthalmic ointment of JANIN was introduced morning and evening, with a view, if possible, of dissipating the dense *nebula* of the left eye; but this was not attended with the desired success. The left eye, though freed from the *procidentiæ* of the *iris*, remained useless to him, but the right was preserved.

CHAP. XV.

OF THE CATARACT.

There are two methods of treating the *cataract*, the one by removing the opake crystalline, from the visual axis of the eye, by means of a needle; the other, by extracting it from the eye, by making a semicircular or lateral incision in the base of the cornea.

It has long been disputed which of these two methods ought to have the preference; and in the warmth of discussion, the advantages of the one, and the disadvantages of the other, have been exaggerated by both parties. Observation and experience, however, the great teachers in all things, seem to have pronounced in favour of the ancient method of treating the *cataract*, or that of *depression*; not only because *depression* is more easily executed than *extraction*, and can be equally employed in every species of *cataract*, whether crystalline or membranous, solid or fluid; but because *depression* is attended with symptoms far less violent and dangerous than those which very frequently happen after extraction; and if from any accidental cause this operation should occasionally prove unsuccessful, it may be repeated two or three times upon the same eye without any risk; a circumstance which *extraction* does not admit of,

when that operation has not had the desired success. Lastly, because in several cases the *extraction* is hazardous and very difficult, as, for instance, when the eye is deeply sunk in the orbit, or in the case of children blind from birth, where the rotatory motion of the eye is so rapid and incessant, and the movements of the whole body so violent, that it is not prudent, under such circumstances, to attempt the division of the cornea.

Influenced by these facts, I have for a considerable time laid aside the method of treating the *cataract* by *extraction*, and have applied myself entirely to the practice of *depression*, and I see continually great reason to be satisfied with the choice which I have made. The very frequent occasions which I have had of performing this operation, have afforded me an opportunity of making some useful alterations relative to the means which are employed previously to its execution; of which I shall now proceed to give a detail.

It is easy to determine whether the operation can be performed with a prospect of success or not. A favourable issue may be expected, whenever the *cataract* is simple, or without any other disease of the eyeball, in a subject not quite unhealthy or decrepid, and in whom the opacity of the crystalline humor has been gradually formed, without having originated from any external violence, or habitual ophthalmia, especially the *internal*: where there has not been frequent pain in the head, eyeball, and supercilium: where the pupil, notwithstanding the *cataract*, has preserved its free and quick motion, as well as its circular figure, in different de-

grees of light, in which there has not been from infancy an oscillatory or tremulous motion of the iris on the slightest motion of the eyeball: and, lastly, where, notwithstanding the opacity of the crystalline lens, the patient retains the power, not only of distinguishing light from darkness, but also of perceiving vivid colours, and the principal outlines of bodies which are presented to him, and where the pupil has that degree of dilatation which it is usually found to have in a moderate light.

It is not equally easy to pronounce concerning that which regards the other part of the diagnosis; that is, whether the *cataract* be hard or soft, caseous or fluid; and whether, together with the opacity of the crystalline lens, the capsular membrane which envelopes it be also opake. All that has been hitherto written and taught upon this subject, has not that degree of certainty which can serve as a guide in practice, and the most experienced oculist of the present day is not able to determine with precision what the nature and consistence of the *cataract* is, upon which he proposes to operate, nor whether the capsule be yet transparent or not, although the lens be evidently opake * †. For it is an indisputable fact, that the capsule sometimes preserves its transparency, when the lens does not.

* Except, however, in the congenital cataract, which in general is *membranous* or *wasted*, in consequence of the crystalline being destroyed, and the two sides of the opake capsule approaching and pressing upon one another, leaving in the centre a small body more opake than the rest.

† Mr. Hey states, that he has generally found a dark-coloured *cataract* in old persons of a firm consistence.

Practical Observ. in Surg. page 49.—Trans.

The want of accurate notions, however, upon this subject, does not materially influence the success of the operation; as the surgeon ought in every case to be prepared to employ such means as the particular species of *cataract* which presents itself to him may require, during the performance of the operation, whether it be hard or soft, accompanied by opacity of the capsule, which invests it, or not. The firm crystalline *cataract* undoubtedly admits of being more easily removed by the needle from the axis of vision than any other; and does not rise again to its former place, if the surgeon in removing it from the pupil use the precaution of burying it in the vitreous humor. The *soft*, the *milky*, or the *membranous cataract*, however, when met with in the operation, may be also removed from the pupil, effused or lacerated with the same needle, without the necessity of introducing any other instrument into the eye *.

With respect to the hard *consistent cataract*, it should be observed, that the word *depression*, used in the schools of surgery to express the manner in which this operation is executed, readily produces in the mind of the student an erroneous idea, that this merely consists in pressing the opake crystalline with the needle, from above downwards, until it descends below the pupil. If this were the case, as there is not a sufficient space for firmly lodging the crystalline lens, between the corpus ciliare and the iris, it would constantly follow, that immedi-

* After the pathological fact published by Riobé, there is no longer room to doubt the possibility of the *black* cataract. See Journ. de Med. de Paris, par le Roux, T. 30.

ately after the operation, the *cataract* would rise up again, either entirely or partially, opposite the pupil. But the word *depression*, in this case, has a much more extensive signification than that which is commonly given to it. It includes two motions which the surgeon makes with the needle; one of pressing down the opake crystalline, the other of burying it in the vitreous humor, by carrying it from before, backwards, out of the axis of vision. By this precaution only, is the opake lens prevented from rising again, and in this sense only ought the term *depression* of the *cataract* to be explained and understood. There is upon this point a circumstance noticed by Parè*, which has not been mentioned by any writer, either before or since his time; that, after the *depression* of the *cataract*, and before the needle is withdrawn, the patient should be directed to turn the eyeball upwards. For by this means, says he, the depressed crystalline, upon which the needle yet rests, must be carried from before, backwards, and buried in the vitreous humor, a circumstance of the greatest importance to prevent the *cataract* from rising again, and which deserves to be carefully attended to by the young surgeon.

Besides this precaution of lodging the firm *cataract*, which is to be depressed, in the vitreous humor, there is another of no less importance to the

* Livre II. chap. xxii. Et étant ainsi abaissée, la lui fait laisser, la tenant sujette de l'aiguille par l'espace de dire une paternostre, ou environ, de peur qu'elle ne remonte, et pendant faire mouvoir vers le ciel l'œil au malade.

success of this operation. This consists in lacerating the anterior convexity of the capsule of the crystalline lens, at the time the latter is depressed, so that whether the capsule be opake or not, the sight cannot afterwards be obstructed by it. For it not unfrequently happens, that those who have not had sufficient instruction or experience in this part of surgery, after the needle has been made to penetrate between the anterior convexity of the capsule, which is yet transparent and the *cataract*, remove the opake crystalline from the axis of vision, and leave the anterior portion of the pellucid capsule in its situation, which, becoming opake a few days after the operation, presents the appearance of a dense whitish veil behind the pupil, which either entirely, or in part, deprives the patient of the power of seeing, and which has very properly received the name of *secondary membranous cataract.*

To be more explicit, the most common cause of failure in the operation for the *cataract*, whatever be the method of performing it, is not owing to the crystalline lens, however dense it may be, but to the capsule of the lens, and more particularly its anterior convexity. It is to be wished, that the art of surgery were in possession of some easy and efficacious means, by which the surgeon, in every method of operating, might be able to separate with exactness, together with the opake crystalline, the entire capsule of the lens from the *zona ciliaris* to which it is attached, an event which occasionally happens from a happy, but unforeseen combi-

nation of circumstances. But this fortunate occurrence * is very rare[1]; as the *zona ciliaris* most frequently connects the capsule of the crystalline

* Richter, Obs. Chirurg. Fasc. II. page 96. [1] Quater inscius, saltem inopinatus, extraxi lentem capsula sua obvolutam. See Janin, Pellier, Gleize, The Edinburgh Essays, vol 5.

It once happened to Monro, in dissecting an eye affected with *cataract*, to observe, after having removed the cornea and iris, that by merely inclining the eyeball in different directions, the crystalline with its capsule separated by its own weight from the *zona ciliaris*, so slight was the union of these parts with each other in this particular and very rare case. MONRO's Works, Num. XXV.

The crystalline, with its capsule, having become opake, has separated spontaneously from the *ciliary zone*, in consequence of falls, blows, or other similar causes. Two cases of it have lately been related: one by CHAMSERU, in the Encyclop. Method. art. Cataracte; the other by DEMOURS, Journal General de Med. T. 18. p. 285. If it could be proved, that the disposition of the crystalline and its capsule, to separate from the *ciliary zone*, increased in proportion to the degree of opacity of those parts, it would afford then nearly a certain rule by which the degree of *maturity* of the cataract might be determined.

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[1] It should be observed, however, that this observation of Richter's applies only to the *extraction* of the *cataract*; for he states immediately afterwards, as will be seen by the following passage, that the capsule is most frequently removed along with the opake lens in the operation of couching. His experiments, however, must be less decisive, inasmuch as they were made upon brutes.

"Qui deprimunt cataractam, lentem solummodo deprimere sibi videntur, capsulamque in loco suo remanere putant. Ego vero puto, plurimisque experimentis persuasus sum, hac operatione plerumque capsulam cum lente deprimi. Sique itaque deprimitur facile capsula cur non extrahatur? Deprimi autem, sequentia probare videntur. Sæpissime coram auditoribus operationem depressionis legitimo modo peregi in oculis suillis, dissectisque dein illis lentem capsula sua integra indutam semper reperi. Ibid. page 97."—TRANS.

lens so closely to the vitreous humor around the *annulus* of Petit, that even in dissecting the eye, it is impossible to separate the capsule from the vitreous humor without considerable laceration. On account of the extreme difficulty, therefore, of obtaining a complete separation of the membranous capsule of the crystalline from its attachments, the surgeon in the greater number of cases has no better means left him to pursue, than to lacerate the anterior convexity of the capsule, through the whole circuit, which corresponds to the pupil in its greatest degree of dilatation at the moment when he removes the opake lens from the axis of vision; for, with respect to the rest of the anterior portion of the lacerated capsule, which continues to adhere to the *zona ciliaris* beyond the greatest disk of the pupil when it is dilated, although it be opake, or should become so after the operation, it can never afterwards prove any obstacle to vision, even in the weakest light; as it will always remain beyond the margin of the iris.

Nor let it be objected that, although this be obtained, the posterior capsule of the crystalline remains in its situation, which, by becoming opake, may occasion the same obstruction to vision as the anterior convexity of the capsule, when that has not been sufficiently lacerated opposite the pupil. For not to insist on the impossibility of depressing and forcing the opake lens backwards, and deeply into the vitreous humor, without the posterior convexity of the capsule being also lacerated, in order to give passage to the crystalline lens, experience

teaches us that, although this portion of the capsule of the crystalline lose its transparency, it is very seldom in so considerable a degree as to injure the sight materially. This fact is proved by the daily practice of extracting the *cataract*, in which operation the surgeon, after making the incision in the cornea, has only to divide the anterior part of the capsule, in order to make the crystalline pass out; without regarding the posterior convexity of this small membranous bag, which he leaves in its situation, without its giving rise, or but very seldom, to any considerable diminution of sight. Anatomy also teaches us, that there are remarkable differences, in several respects, between the anterior and posterior portions of the capsule of the crystalline lens. One of the principal differences is, that the anterior portion of this membranous bag is in its natural state, at least three or four times thicker and firmer than the posterior. The second difference, equally remarkable, is, that the delicate posterior hemisphere of the capsule is furnished with a set of vessels peculiar to it, and altogether distinct from that which is transmitted to the anterior convexity of this sac, as the first is formed by the extremity of the *arteria centralis*, which, as if from a centre, distributes branches to the circumference, while the anterior hemisphere of the capsule of the crystalline, which, as I have already said, is more compact than the posterior, receives its blood-vessels from those of the vitreous humor, which, having passed over the *zona ciliaris*, are irregularly incurvated, and ramify upon the anterior surface of the capsule. I do not, however,

pretend from all this to infer that the posterior portion of the capsule of the crystalline never loses its natural transparency, but only to prove, from observation and experience, that even when it does become so, it is seldom the cause of perfect blindness. It is proper to repeat, that the principal obstacle to the favourable success of the operation for the *cataract*, in both methods, arises most frequently from the anterior convexity of the capsule of the crystalline becoming opake, and sometimes more dense than in its natural state, or from its being converted into a soft and pulpy substance.

A fact of no less importance to be known than the preceding, but which more particularly relates to the operation of the *cataract* by *depression*, is that the opake crystalline removed from the axis of vision and lodged in the vitreous humor, provided it is deprived of its investing membrane, gradually diminishes in size from its circumference towards its centre, and ultimately disappears altogether. This phænomenon is unquestionable, and is proved by a very extensive series of observations made by men of the greatest accuracy and impartiality, to which I can add three other instances of my own upon this subject. The first was in a nobleman of Pavia, aged 60, who died precisely a year after he had undergone the operation of couching for a *cataract* in the right eye; the other was in a woman, 43 years of age, who died three years after the depression of the *cataract*; and the third in a man, 57 years of age, who died about three years and a half after the same operation had been performed. In the first of these three subjects I

found the crystalline deeply imbedded in the vitreous humor, and reduced to about one third its natural size; and in the other two, in which the crystalline was deeply situated in the vitreous humor below the axis of vision, there was only the nucleus remaining of a size little larger than the head of a common pin.

The depressed crystalline disappears even in a shorter time, that is, in a few weeks, when it has degenerated into a pultaceous, cheesy, or milky substance. And when it is divided, reduced to fragments, and dissolved in the aqueous humor, it is finally absorbed, together with the aqueous fluid, which is continually renewed. This circumstance relative to the dissolution and absorption of the depressed crystalline, as it is beyond all doubt *, furnishes a powerful argument for asserting, in opposition to those who think unfavourably of this method of operating, that there is no species of *cataract* which may not be cured by *depression.*

This dissolution and absorption takes place, not only with respect to the crystalline lens, but also with regard to the membranous particles of the capsule of the crystalline; when they are detached from the surrounding parts, broken down by the

* Many celebrated modern surgeons might be cited, who have observed, and recorded this very important fact; but I shall content myself with merely quoting the words of Barbette on this subject, one of the oldest writers. Licet, says he, cataracta non satis intra pupillæ regionem sit depressa, dummodo in particulas sit divisa, perfecta visio intra sex aut octo septimanas sæpissime, licet tota operatio absque ullo fructu peracta videatur; quod aliquoties experientia eductus loquor. CHIRURGIA BARBETTIANA, cap. xvi. part I.

needle, and float freely in the aqueous humor suspended in the form of small flakes, or fall to the bottom of the two chambers of that humor. It is constantly observed, in this case, that these membranous fragments of the capsule, deposited behind the cornea, first assume the whiteness of milk, they then become of a yellowish colour, and afterwards liquefy and dissolve in the aqueous humor; finally, that they diminish in quantity, and disappear entirely, leaving the cornea and the whole of the eye in the most perfect state of transparency. Any one may easily trace this salutary process of nature, step by step, whenever he meets with a case, where, either accidentally or by design, some membranous shreds of the capsule of the crystalline have been pushed through the pupil, and deposited in the anterior chamber of the aqueous humor, that is, between the iris and the concavity of the cornea. I have had frequent opportunities of repeating this observation. For in several cases of *membranous cataract*, as I shall afterwards shew, I have pushed these membranous flocculi into the anterior chamber of the aqueous humor, in such quantity as to fill it on a level with the lower margin of the pupil, so as to form the appearance of an *hypopion* in it. I have observed, in these cases, that this collection of flocculi and particles of the capsule confined between the iris and concavity of the cornea, has never occasioned the patient any inconvenience, that is, either inflammation or pain; and that it is also constantly dissolved and removed by absorption, in a month or little more, and sometimes sooner. It is to be observed, also, that the

absorption of the membranous flakes takes place more rapidly in the anterior than the posterior chamber of the eye, which may depend on the greater quantity of aqueous humor in the anterior chamber, by which the membranous particles are more readily dissolved than in the posterior; or may be owing to the greater quantity of absorbent vessels in that chamber than in the posterior. If it be true, therefore, as it indisputably is, that when the *membranous cataract*, or that formed merely by the opake capsule of the crystalline, remaining opposite the pupil, after the removal of the lens, is broken into small particles by the needle, and pushed through the pupil into the anterior chamber of the aqueous humor, it may, by the powers of nature, be dissolved and removed in the same manner as the depressed lens is dissolved, and finally absorbed; it is evidently proved, I think, that the *membranous cataract* can be also cured by the needle, notwithstanding the assertion of those who contend that this species of *cataract* can only be removed by means of *extraction*. Instead of attributing the want of success in the operation of *extraction* to their being unable, for weighty reasons, to perform it, in preference to *depression*, as for example in children blind from birth, in whom the *cataract* is almost always membranous, they ought rather to confess their negligence in not having passed the fragments of such *cataract* into the anterior chamber of the aqueous humor; that they might be there rapidly dissolved and absorbed by it.

The apparatus of instruments necessary for performing the operation of the *cataract*, by *depression*, consists of a needle for that purpose, and an elevator of the upper eyelid, which is employed particularly in those cases in which the eye to be operated on is small, deeply sunk, and where the patient is very unmanageable. The elevator of *Pellier* * is preferable to all others, as it collects the eyelid, and raises it against the superior arch of the orbit, making little or no compression upon the eyeball; provided it is used with a gentle hand, and without pressing the fold of the eyelid too much against the edge of the orbit.

With respect to the needle, most proper for the depression of the *cataract*, experience has taught me, that of the great number which have been proposed for this purpose, we ought generally to prefer that which unites to the greatest fineness, such a degree of firmness as will enable it to penetrate the membranes of the eye without bending. Since I have used a very fine needle, I have never had to contend with any consecutive symptoms of importance after the operation of *depression*, not even with suppuration of the membranes of the eye at the place of the puncture. If, indeed, the symptoms consequent on this operation are in proportion as might be expected to the injury and solution of continuity, which takes place in the parts of the eyeball, and particularly of those which are endowed with exquisite sensibility; it is certain that when the needle is of the finest

* Plate III. fig. 1.

kind *, if, after it has penetrated the eye, it is merely conducted upon the capsule of the crystalline, the lens, and the vitreous humor, parts which are insensible, the operation must be always attended with very little pain, and the consequences of the puncture constantly, or in the greater number of cases, of little or no moment.

With respect to the form of the needle, I have had an opportunity of observing, that the one with a straight point, which is commonly used in this operation, is not the best calculated for conveniently lacerating the anterior convexity of the capsule of the crystalline, and of removing the *cataract*, at the same time, easily and expeditiously out of the axis of vision, and lodging it deeply in the vitreous humor. For whatever part of the eyeball is pierced beyond the *corpus ciliare*, whether

* From the accounts which I have had from distant countries, I am compelled to say that the instrument makers have fallen into an error respecting the form and size of the needle here described; by entirely neglecting the figure which I have given of it, they have curved the point of it at pleasure, and have not made it sufficiently sharp at the edges, and what is worse have given the instrument four times at least the thickness of that which is delineated[1].

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[1] The author having politely sent the translator some patterns of his needles which have been put into the hands of the instrument makers, this defect will for the future be obviated. The translator, long aware of the excessive thickness of the instruments generally used in couching, has for some time employed a needle made perfectly round instead of being triangular at the point, the simple form of which admits of its being reduced to the greatest possible fineness, and consequently to a size even considerably less than those of the author, when properly constructed.

at a line from the union of the cornea with the sclerotica, at two, or two lines and a half, as some advise, the point of the straight needle, which is made to advance upon the anterior convexity of the capsule, passes directly against the iris, and when it has reached it, presses only upon one point of the circumference of the capsule and lens in the manner of a tangent. In the motion which the surgeon gives to the point of the needle from before backwards, in order to press it firmly upon the centre of the capsule and lens, the pressure which he applies upon these parts is in reality only made by the body of the needle, the point of the instrument not penetrating the anterior convexity of the capsule and the crystalline lens, until these parts have been so far removed from the pupil towards the bottom of the eye by the body of the needle, that its point, with respect to the part of the eyeball which it has penetrated, has taken a direction from before, backwards. But since, as I have said, in removing the capsule and lens from the pupil, the pressure is not made by the point, but the shank of the needle; hence it very frequently happens, that in this movement, the anterior convexity of the capsule, however small its resistance, is not lacerated, and the *cataract* being compressed, revolves round the instrument, and makes various gyrations above and below the pupil, and cannot after all be firmly fixed by the point of the needle, until after having been by different motions, and repeated pressure, removed from the pupil towards the bottom of the eye, it can be directly pierced by the point of the instrument,

which is sufficiently inclined for that purpose from before backwards. But if the *cataract* be of a *milky*, *soft*, or *cheesy* consistence, and consequently its capsule flaccid and yielding, the shank of the straight needle is only imbedded in the capsule, without opening or lacerating it, and the surgeon is then obliged to make several movements with the needle, in order to remove it from the pupil, to retract the instrument, and turn the point of it backwards, that he may pierce and lacerate the fore part of the capsule. Maître-Jean, speaking of the *milky cataract*, has made the same observation. "Many fruitless attempts are frequently made, on account of the needle gliding only upon the membrane which covers the crystalline; which, in such attempts, always remains entire, unless the instrument be a little withdrawn, in order to carry the point of it towards the middle of the *cataract*, for the purpose of pressing it upwards to break the membrane.*"

These difficulties are entirely, or for the most part avoided, by using a very fine needle, moderately curved at the point, such as that which I employ †. The curved extremity of this needle

* Traité des maladies de l'œil, chap. xiii.

† Plate III. fig. 10.

Besides the reasons before assigned, an accident happened to me in performing the operation for the *cataract* with a straight needle, badly tempered, which proved to me the advantage of the *curved* needle over the *straight* one. In introducing the needle, through a very firm sclerotic coat, it happened that its point bent in the form of a *small hook;* which I perceived as soon as the instrument appeared between the pupil and the capsule of the crystalline lens. I proceeded, however, with the operation, and having pushed the point of the small

is flat upon its convex surface, sharp at the edges, and has a concavity consisting of two oblique planes, forming a slightly elevated line in the middle, which is prolonged as far as the extreme point of the instrument, similar to the curved needle for stitching wounds. The handle is marked in the direction corresponding to the convexity of the curved point *.

The needle now described penetrates the eyeball with the same facility as a straight one of an equal degree of fineness. When it is cautiously pushed

hook through the capsule into the firm substance of the crystalline lens, I removed both from the axis of vision with the greatest facility, and afterwards withdrew the needle very cautiously from the eye, without producing any laceration. This circumstance happened to me in the practical school, in the presence of a great number of students, and the event was as favourable as possible.

Dr. Morigi, senior surgeon of the Hospital of Piacenza, one of the most expert and able operators at present in Italy, has now adopted the use of this *curved* needle for several years in the *depression* of the *cataract*, and with so much ease and success, that he takes every opportunity of recommending and promoting the use of it.

* Freytag, in his dissertation inserted in the 2d volume of the Chirurgical Dissertations, published by Haller, mentions, that his father employed a needle with a curved point for depressing a membranous *cataract;* and he adds, that he extracted the membranous *cataract* from the eye with the same instrument. The latter is certainly an exaggeration.

Bell, in the 3d volume of his system of surgery, Plate XXXII. fig. 4, has given the figure of a curved needle for the *depression* of the *cataract*. He says, he has frequently thought that the *cataract* might be more easily depressed by means of this needle than the straight one; but that he has not yet had sufficient opportunities of using it to be able to speak decisively of its advantages.

forwards, and is placed between the iris and the anterior convexity of the capsule of the crystalline, it is situated with its convexity towards the iris, and its point in the opposite direction towards the capsule and opake lens, which it easily and deeply pierces by the smallest motion from before backwards, without the lens having been previously removed from the pupil. With this instrument the surgeon readily succeeds in lacerating the anterior convexity of the capsule extensively, in deeply and firmly piercing the opake lens, conducting it out of the axis of vision and lodging it securely in the vitreous humor. In cases of the *caseous*, *milky*, or *membranous cataract*, the soft pulp of the crystalline may be broken into small parts, by means of the curved point of the needle, with the utmost facility, and the anterior convexity of the capsule torn into small flakes; which membranous flocculi may, with equal ease, by turning the point of the instrument forward, be pushed through the pupil into the anterior chamber of the aqueous humor, where being precipitated they are, as will be afterwards seen, dissolved, and absorbed by the powers of nature.

Having premised these general observations on the *depression* of the *cataract*, I now pass to a detail of the operation itself, according to the method which I have adopted.

In general the best surgeons do not now prepare patients indiscriminately, as was formerly the case, for any of the great operations, without manifest indications for doing it; and much less that which is employed in the case of *cataract*, unless the term preparation be applied to the diet which is for

some days prescribed to the patient, or the administration of a clyster the night previous to the operation. There are, however, in the case of *cataract*, particular circumstances, whatever be the mode of operating, which oblige the surgeon to depart from the general rule, and to subject the patient to some method of treatment preparatory to the operation. These circumstances occur in persons who are dyspeptic, or hypochondriacal, in women subject to hysterics, and in those whose eyes, independently of the *cataract*, are at the same time affected with tumefaction of the edges of the eyelids, chronic redness of the conjunctiva, and a copious gumming.

In cases of dyspepsia, hypochondriasis, and hysteria, it is proper, two or three weeks before the operation, to order the patient strong, farinaceous, aromatic broths, and at the same time stomachic bitters and corroborants, of which, the infusion of quassia, in such cases, is particularly useful, either with the addition of a few drops of the vitrolic æther, or without, according to the particular constitution and sensibility of the patient. As a sedative and corroborant remedy, one of the most useful is a powder consisting of a dram of the cinchona, and a scruple of the radix valerianæ sylvestris taken two or three times a day, the patient observing, in every other respect, a proper regulation of diet. It is a most certain and constant fact, that the less timid and nervous the patient is, the milder are the symptoms consequent on the operation.

Where the edges of the eyelids are tumefied,

incrusted, and gummed, with relaxation of the conjunctiva, chronic redness, and weeping of the eye, it is highly advantageous, two or three weeks before the operation, to apply a large blistering plaster to the neck, and to introduce between the eyelids, morning and evening, the ophthalmic ointment of JANIN, with a double or triple quantity of lard; and during the day, the vitriolic collyrium with mucilage of quinceseed, every two hours, in order to restrain the morbid secretion of the ciliary glands, and internal membrane of the palpebræ; to strengthen the conjunctiva and its vessels, and to restore the edges of the eyelids to their natural state and flexibility, before proceeding to the *depression* of the *cataract*. In this also as in all other operations of surgery the success depends greatly on the patient's healthy constitution, not only as it respects the immediate consequences, but also the firm state of the crystalline; for it is a practical fact, well established, that in persons of an unhealthy habit of body, the *cataract* is generally soft and caseous, and the operation consequently rather more difficult and tedious. In these subjects the eyes are also flaccid and disposed to infiltrations of bloody lymph elevating the conjunctiva in the form of *chemosis*, which, though without pain, greatly retard the perfect cure. In operating therefore for *cataract* on hysterical, hypochondriacal or persons of a generally unhealthy habit of body, the young practitioner will be cautious, not like the empiric to promise more than he is empowered by the limits of his art.

Every thing being arranged for performing the

operation*, the surgeon should place his patient on a low seat, at the side of a window, which has a northern aspect, so that the light coming from it may only fall upon the eye which is to be operated on laterally. The other eye being covered, although affected with *cataract*, the surgeon ought to place himself directly opposite the patient, upon a seat of such a heighth, that when he is prepared to operate, his mouth should be on a level with the patient's eye. And, in order to give his hand a greater degree of steadiness in the several movements which the *depression* of the *cataract* requires, the elbow should be supported upon the knee of the same side, which for this purpose he should raise sufficiently by resting his foot upon a stool, or if necessary also, by placing a small hard pillow upon his knee. An able assistant situated behind the patient, with one hand fixed under the chin, should support the patient's head against his breast, and with the other placed on the forehead, gently raise the upper eyelid by means of PELLIER's elevator, carefully observing to gather the eyelid against the arch of the orbit, without pressing upon the globe of the eye†.

* With children, and particularly those born blind, I am in the habit, in order to prevent their moving, of confining them by a large bandage applied from the top of the shoulders as low as the feet, and of placing them horizontally on a table with the head a little raised.

† This is a point of the greatest importance, and it is very difficult to find an assistant who has sufficient knowledge and dexterity to avoid this inconvenience. If the operator can accustom himself to keep the eyelids separated with the thumb and forefinger of either hand, he will find a great advantage in it.

Supposing then the eye to be operated on is the left, the surgeon taking the curved needle in his right hand, as he would a writing pen, with the convexity of the hook forwards, the point backwards, and the handle in a direction parallel to the patient's left temple; should rest his fingers upon the temple, and boldly perforate the eyeball in its external angle, at rather more than a line from the union of the cornea and sclerotica*, a little below the transverse diameter of the pupil, gradually moving the extremity of the handle of the needle from behind forwards from the patient's temple, and consequently giving the whole instrument a curved motion, until its bent point has entirely penetrated the eyeball; which is effected with the greatest readiness and ease. The operator should then conduct the convexity of the needle upon the summit of the opake crystalline, and by pressing upon it from above downwards, cause it to descend a little, carefully passing the point at the same time between the corpus ciliare and the capsule of the crystalline lens, until it be visible before the pupil, between the anterior convexity of the capsule of the lens and the iris. Having done this he should cautiously push the hook with its point turned backwards towards the internal angle of the eye,

* Albucasis. Tantum recedendum a cornea, quantum specilli cuspis spatii contineat.

F. d'Acquapendente. Si aliqua datur in suffusione operatio tuta, eam forte futuram, ut vel acus prope corneam immittatur, vel si aliquanto longius ab illa, non tantum tamen quantum vulgo faciunt. *De Chirurg. Operat. cap. xvii.*

passing it horizontally between the posterior surface of the iris, and the anterior convexity of the capsule, until the point of the needle has arrived as near the margin of the crystalline and capsule as possible, which is next the internal angle of the eye, and consequently beyond the centre of the opake lens. The operator then inclining the handle of the instrument more towards himself, should press the curved point of it deeply into the anterior convexity of the capsule, and substance of the opake crystalline, and by moving it in the arc of a circle, should lacerate the anterior convexity of the capsule extensively, remove the *cataract* from the axis of vision, and lodge it deeply in the vitreous humor, leaving the pupil perfectly round, black, and free from all obstacle to the vision. The needle being retained in this position for a short time, if no portion of opake membrane appear behind the pupil, which would require the point of the instrument to be turned towards it, in order to remove such obstacle, (for with respect to the crystalline depressed, in the manner now described, it never rises again,) the surgeon should give the instrument a small degree of rotatory motion, in order to disentangle it easily from the depressed *cataract*, and should withdraw it from the eye in a direction opposite to that in which it had been introduced, that is, gently inclining and turning the handle towards the patient's left temple.

In every species of *cataract*, where the opacity and density of the anterior hemisphere of the cap-

sule of the crystalline is considerable, the surgeon may very easily know, during the operation, whether the curved point of the needle, insinuated between the corpus ciliare and the capsule, is uncovered between the pupil and the anterior hemisphere of that membrane; or, whether having penetrated into the membranous sac of the crystalline, it has only advanced between the anterior hemisphere of the capsule and the opake lens. But when the capsule, notwithstanding the opacity of the crystalline lens, preserves in a great measure, or entirely, its transparency, it is an easy matter for a young surgeon, not sufficiently conversant with this operation, to commit an error, and one of great importance, that is, to remove the *cataract* from the axis of vision, and lodge it in the vitreous humor, leaving the anterior convexity of the capsule untouched, which afterwards gives rise to the *secondary membranous cataract.*

To avoid this serious inconvenience, every operator should be particularly careful to satisfy himself before making any movement with the point of the needle for depressing the *cataract,* that the curved extremity of the instrument is really, and not apparently, placed between the pupil and the anterior portion of the capsule, of which he will be convinced by the degree of light which the convexity of the hook presents to him, and the facility which he finds in pushing it forwards through the pupil towards the anterior chamber of the aqueous humor, and in moving it horizontally between the iris and anterior hemisphere of the capsule. On

the contrary he may be certain that the curved point is within the membranous sac of the crystalline, by observing that the extremity of the needle is obscured and covered by a more or less transparent veil; that he meets with some resistance in pushing it through the pupil into the anterior chamber of the aqueous humor; and that in doing it, the membranous veil which covers the hook is elevated towards the pupil; and lastly, that the point of the needle is with difficulty conducted horizontally between the iris and the *cataract*, from the external towards the internal angle of the eye.

The surgeon will remedy this inconvenience, by giving a slight rotatory motion to the needle, by which the point being turned forwards will pass through the anterior portion of the capsule opposite the pupil; the point of the instrument being then turned backwards again, should be passed horizontally between the iris and the anterior hemisphere of the capsule towards the internal angle of the eye; and having reached this part should be boldly plunged into the capsule, and the substance of the opake lens, in order to lacerate the former extensively, and to convey the latter deeply into the vitreous humor out of the axis of vision, and thus complete the operation.

When, without observing this precept, the opake lens is removed, or, more strictly speaking, enucleated from its capsule and lodged in the vitreous humor; and the anterior convexity of this membrane being left entire, is slightly opake, the pupil will appear black, and so free from obstruction to

the light as easily to deceive the young surgeon, and induce him to believe that the operation has been properly executed. But persons experienced in this part of surgery, will instantly perceive, that the pupil under such circumstances, has not the full and perfect degree of blackness which it ought to have, and that this slight dimness is caused by an imperfectly transparent membranous veil, placed between the pupil and the bottom of the eye, which, when suffered to remain, never fails, in process of time, to give rise to the *secondary membranous cataract.* In this case, the operator having depressed the opake lens, should immediately turn the curved point of the needle forward, and pass it through the pupil into the anterior chamber of the aqueous humor, in order to perforate this semi-transparent membranous veil with the greater certainty; then directing the point of the needle backwards and making it pass as far as possible between the posterior surface of the iris and the membrane, should press the point of the instrument into it and lacerate it from before backwards, making a movement as if he had to depress the lens again. In doing this he will have the satisfaction to see the pupil assume the deep black colour of velvet, and a degree of clearness which it had not before, although the opake lens had been completely removed from the axis of vision.

It has before been stated that in conveying the *cataract* out of the axis of vision, the operator should endeavour to leave the pupil not only black, but also perfectly round. This subject deserves to be further considered. For it sometimes happens, either at the

beginning or end of the operation, that in the act of removing the lens, though the pupil becomes black, yet it assumes an oval figure, and becomes also more oblong, in proportion as the operator attempts to depress the *cataract* in the vitreous humor. This phenomenon is a certain sign that the capsule of the crystalline is adherent to some part of the posterior surface of the iris, and more precisely at the part where the pupil is elongated. If under these circumstances the operator withdraw the needle from the eye, a portion of opake capsule will be found to appear some days after, on one side of the pupil to which oculists apply the term *accompaniment (accompagnamento.)* In order to avoid this inconvenience before the needle is withdrawn from the eye, it will be proper to turn the point of it forwards close to the posterior surface of the iris at the part where the pupil is observed to be elongated, and to detach the portion of the capsule of the crystalline, adhering to this membrane; after which the pupil will regain its circular figure.

Hitherto I have supposed the *cataract* to be of a *firm* consistence, and to resist the pressure of the needle. But if the operator should meet with a fluid *cataract*, the *milky* for instance, which is not an unfrequent occurrence*, when the needle has been passed between the corpus ciliare and the capsule, until it appears uncovered between the pupil and the anterior hemisphere of the membranous

* In the greater number of cases which have fallen under Mr. Hey's care, the *cataract* has been found so soft as to permit the needle to pass through it in all directions.

Pract. Observ. in Surg. p. 60.—TRANS.

sac of the crystalline lens, and the curved point has been cautiously advanced between the iris and the margin of the capsule, nearest the internal angle of the eye; at the moment when the point of the instrument is deeply pressed into the capsule and *cataract*, a whitish milky fluid will be seen to issue from the capsule, which, extending itself in the form of a cloud or of smoke, will be diffused through both the chambers of the aqueous humor, and obscure the pupil and the whole of the eye. The surgeon should not on this account lose his confidence, but, guided by his anatomical knowledge, should make the small hook describe the arc of a circle from the internal towards the external angle of the eye, and from before backwards, as if he were depressing a solid *cataract*, with a view of lacerating, as much as possible, the anterior hemisphere of the capsule, upon which the favourable success of the operation principally depends, not only in this, but in every other species of *cataract*. For as to the effusion of the milky fluid into the chambers of the aqueous humor, it disappears spontaneously a few days after the operation, and permits the pupil and the whole of the eye to resume its former natural brightness.

The method of operating which the surgeon should employ will be little different from this, if, during its performance, he should meet with a *soft* or *cheesy cataract*. The anterior convexity of the capsule should be lacerated as much as possible opposite the pupil, so that the opening may equal the diameter of it in its ordinary dilatation. With respect to the pulpy substance of the *cataract*, which, in such cases, remains behind, partly diffused in the

aqueous humor, and partly swimming behind the pupil, all that is necessary is to divide the most tenacious parts of that substance, that they may be more easily dissolved in the aqueous humor, and to push those molleculæ of the caseous substance of the crystalline, which cannot be sufficiently divided, through the pupil into the anterior chamber of the eye, in order that they may not be carried opposite the pupil, but being situated at the bottom of the anterior chamber, may be gradually dissolved and absorbed without obstructing the sight*.

* The constancy of this phænomenon has induced Sir W. Adams to proceed still further, and to cut in pieces with the needle, not only the *soft* and *membranous*, but the *hard cataract*, and to push it into the anterior chamber of the aqueous humor, in order to obtain its dissolution and absorption[1]. *Practical Observations on Diseases of the Eye, London*, 1812.

As will appear from the first edition of this work, I was the first to make an useful application of this beneficial process of nature, absorption, which I found also more rapid in the anterior than the posterior chamber of the aqueous humor[2], and for the ad-

[1] It is proper to remark, that the author of these observations, in a work lately published, appears to have abandoned his former opinions on this subject in favour of a *new* method of operating in cases of *hard cataract*, in which he proposes, first, to push the entire lens into the anterior chamber of the eye, by means of the needle, the pupil being previously dilated by a weak solution of the extract of Belladonna, and then to *extract* it from the eye, making a smaller opening in the cornea than is usually practised, and introducing between the iris and cataract a small hook, for the purpose of removing it. *New Operations for the Cataract*, 1817.—Trans.

[2] The dissolubility of the crystalline lens, when exposed to the action of the aqueous humor, has unquestionably been a fact long known, but has been more particularly noticed by our countryman, Pott, who, with the ingenuousness of a great mind, does

For this purpose, I find it easier to make these fragments of the crystalline and capsule pass, by

vantage of *depression,* precisely in those cases in which that operation is regarded as unsuccessful. At that period I was fully satisfied, that the *hard* nucleus of the opake crystalline, even when reduced to pieces, is with difficulty, and not till after a very long time, dissolved in the aqueous humor; on which account I have been sometimes obliged to extract it, by opening the cornea, in order to put an end to the obstinate ophthalmia and pain occasioned by it, and the apprehension of closure of the pupil, in consequence of the pressure or friction made by the hard pieces of nucleus on the iris from the motions of the eyeball.

Now from these facts, which are also recorded by this gentleman, and to which he adds, even ulceration of the cornea, occasioned by the presence of the nucleus of the crystalline in the anterior chamber of the eye, it appears to me, that there is no one who, being able in an instant to lodge a *hard cataract* in the lower and back part of the vitreous body, and thus in a moment restore the patient's sight, would wish, simple as this operation is, to render it complex, and defer the good effects of it for several months, not reckoning on the intractable ophthalmia, pain, and the fear of closure of the pupil to which the patient is exposed. It would seem, too, as if writers on these subjects would never cease to revive the ill-founded opinion, that the *solid* cataract, properly lodged in the vitreous humor, rises again. It rises if it has been depressed from above downwards, but not if it has been deeply buried at the lower and posterior part of the vitreous body. I am therefore of opinion, that, however useful and necessary it may be to divide in pieces the *soft, membranous,* or *capsular cataract,* and to transport the fragments into the anterior chamber of the aqueous humor, the same operation is no less disadvantageous and unnecessary in the treatment of the *solid* cataract.

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not claim the discovery of it, but expresses himself rather as having repeated the experiments and observations of others, and enforced the proper application of them. *Chirurg. Works,* Vol. III. p. 228.—TRANS.

pressing them from behind forwards, than by drawing them into the anterior chamber of the aqueous humor with the point of the curved needle, introduced into the eye through the cornea, as BACHHORN and LANGEBECK propose, even when the pupil has been previously dilated artificially by means of the extract of Belladonna. The difficulties are increased, if, in the various movements of the needle, a discharge of the aqueous humor takes place, and consequently the collapsion of the cornea and iris.

The *secondary membranous cataract*, from what has been already stated, is not so much a distinct species of *cataract* as a consequence of the operation imperfectly executed, or which, from some particular accident, has not been attended with complete success. For the disease is most frequently formed by the anterior convexity of the capsule of the crystalline remaining entire in its situation, after the opake lèns has been removed, or which has not been sufficiently lacerated to allow a free passage to the light through the pupil.

The *secondary membranous cataract* sometimes appears behind the pupil in the form of membranous flocculi suspended in the aqueous humor of the posterior chamber, filling up the pupil; at other times it represents triangular membranous borders, the bases of which are attached to the *ciliary zone*, the apices extending opposite the pupil. When it consists merely of a single small membranous ke, suspended in the posterior chamber of the ous humor, or fine triangular membranous pro- it is rot necessary on this account to subject ient to a second operation, since it does not

materially obstruct the sight, and in process of time disappears spontaneously. But when the *secondary membranous cataract* is formed by a mass of membranous particles, collected in the posterior chamber of the aqueous humor opposite the pupil, in such a degree as entirely, or in a great measure, to close it up (an occurrence which also happens when the anterior chamber of the aqueous humor is so unusually small and confined as not to be capable of containing the whole of the membranous flocculi of the capsule, a considerable part of which must necessarily remain behind in the posterior chamber); or when the disease consists in the anterior hemisphere of the opake capsule, not being sufficiently lacerated, and adhering to the whole of the *ciliary zone*, then it becomes necessary to have recourse to another operation. For although, in the first case, there is sufficient ground to believe, that the mass of membranous flocculi may in time dissolve and disappear, yet it is not proper to leave the patient in a state of perplexity, deprived of sight for weeks or months, when it can be speedily obtained by a safe and easy operation; and in the second case, the operation is absolutely necessary, as the lacerated capsule adhering every where to the *ciliary zone*, seldom or ever disappears; and in time rather increases in bulk, and becomes more opake than at first.

In both these cases of *secondary membranous cataract*, the operation is performed in the following manner. In the first case where the mass of the particles of the capsule loosened from the *ciliary*

zone close up the pupil, the surgeon having introduced the curved needle into the eye with the usual cautions, and pushed it into the posterior chamber, in contact with the mass of membranous flakes which obstructs it, should turn the instrument towards it, and press the whole of the membranous flocculi through the pupil one after another into the anterior chamber of the aqueous humor, precipitating them into the bottom of this chamber, between the concavity of the cornea and the iris. I am convinced from experience, that any attempts made to remove these portions of membrane from the pupil, although perfectly loose, and to immerse them in the vitreous humor, in the same manner as the lens, are quite useless; for no sooner is the needle withdrawn from the eye, than the whole of the particles, as if conducted by a current, appear filling up the pupil again. On the contrary, when they are pushed through the pupil into the anterior chamber of the aqueous humor, they can no longer obstruct the pupil, but are macerated at the bottom of this cavity without occasioning the patient any inconvenience, and in a few weeks dissolve and disappear altogether*.

* It is the practice with some to instil into the eye, on the evening before the operation, one or two drops of a solution of 3 grains of the extract of Belladonna in 6 drops of water, or, which answers still better, of a solution of a dram of the extract of Hyoscyamus in an ounce of water, in order to dilate the pupil at the time of the operation. If the crystalline is solid, and its capsule disposed to separate completely from the *ciliary zone*, it is undoubtedly advantageous; but if the lens is soft, and the capsule friable, so that it is necessary to reduce them to pieces, and to

'In the second case, when the *secondary membranous cataract* is formed by the whole of the anterior portion of the capsule, or by several portions of it adhering to the *ciliary zone*, the surgeon having turned the point of the curved needle towards the pupil, should perforate the membranous *cataract* from behind forwards: or if its borders leave any interval between them, sufficient to admit the convexity of the instrument, he should pass the hook through this opening; then turning the point of it backwards, should conduct it horizontally between the iris and the membranous *cataract*, as near as possible to its attachment with the *zona ciliaris*, and pressing the point of the hook into it, and into each border of it in succession, sometimes rotating the instrument between the fingers, as if to twist the portion of capsule round the point of it, he should lacerate it as much as possible, in every part of its circumference, so as to clear the whole ambit of the pupil; and having collected all the pellicles or flocculi together, should push them with the point of the needle through the pupil into the anterior chamber of the aqueous humor, as has been just stated. In doing this, the greatest care should be taken by the operator not to touch the iris; for on this precaution principally depends the prevention of any consecutive symptoms of importance, notwithstanding the length of the opera-

make them pass into the anterior chamber of the aqueous humor, the too great dilatation of the pupil renders the passage of these particles back again into the posterior chamber easy, and necessarily retards their absorption.

tion, and the various movements which it may be necessary for him to make with the needle in the eye, in order to accomplish his purpose. And if a portion of the membranous *cataract* should be found adhering to the posterior surface of the iris, which will be known by this circumstance, that in stretching the small opake membrane with the needle the pupil changes its figure, and from being round, becomes oval or irregular; he should proceed with even greater caution than in the preceding case, making repeated, but small and gentle movements with the needle in every direction, in order to obtain the separation of it, without endangering the laceration of the iris at its union with the *ciliary* ligament.

Nor will it be necessary to vary, in any manner, the method of operating, when the *secondary membranous cataract* is formed by the posterior convexity of the capsule having become opake at any period after the operation. For after the crystalline is removed, this delicate membrane is forced forwards, so as to be in contact with the posterior surface of the iris, and is pushed, as it were, almost within the pupil. In order to precipitate it into the anterior chamber of the aqueous humor, and thereby remove the obstruction, it is only necessary to press it from behind forward with the point of the needle; which is the more easy, as the posterior hemisphere of the capsule of the crystalline loosened from the *ciliary zone*, has no considerable adhesion to the concavity of the vitreous humor, except from the very small trunk of the *central* artery.

The same method of operating is to be pursued in those uncommon cases in which the *cataract* is entirely, or in a great measure, *primitively membranous.* I design to speak of that particular species of *cataract* in which the crystalline wastes, or is dissolved and disappears, leaving only its opake capsule, or at most a small nucleus not larger than a pin's head within it. This singular species of *cataract* is most frequently met with in children, or persons who have not exceeded their 20th year, and may be distinguished from the others by a certain transparency and resemblance to a spider's web, or by a sort of reticulated structure, interrupted with a whitish opake spot in its centre or circumference. Any attempt in this case to lodge this membrane in the vitreous humor would prove fruitless, as it would rise again and re-appear behind the pupil immediately after the operation. The best and surest practice yet proposed, therefore, is to lacerate it with the point of the curved needle, and to push the different particles composing it successively through the pupil into the anterior chamber of the aqueous humor, where, as it has been before observed, it is dissolved, and in the course of three weeks is removed by absorption.

With respect to the after-treatment of the operation of couching, it is only necessary, in general, that the patient should lie in bed, with his head a little raised, in a dark room, and that the eye operated on should be covered with a piece of dry linen pinned to his night-cap. If he should complain of vivid heat in the eye and eyelids immediately after the operation, it will be proper to

cover them with a compress of soft lint, dipped in the white of an egg and rose-water, beaten to a froth, with a small piece of alum. But if, notwithstanding this, the pain and tumefaction of the eyelids increase, it will be necessary to cover the eye with bags of emollient herbs, and by these, as well as by general remedies, prevent the progress of the inflammation.

In persons of exquisite general sensibility, in those affected with hypochondriasis or hysteria, notwithstanding the precautions above-mentioned are taken previously to the operation, nervous affections are occasionally excited shortly after the operation, as vomiting, violent headach, shivering, and coldness of the whole body. In these cases I have found nothing allay this perturbed state of the nervous system more speedily than a clyster, consisting of 8 ounces of the infusion of chamomile, and 2 grains of opium dissolved in it, as the opium, when given by the mouth, is constantly rejected.

In very weak and timorous persons it very frequently happens, that on the 3d or 4th day from the operation, they are seized with symptoms of indigestion, accompanied with an increase of general heat, especially during the night, as bitter taste, nausea, disposition to vomit, pain in the head, tension of the hypochondrium, flatulency, universal uneasiness, and watchfulness. A gentle purgative, and the repeated use of clysters are in general sufficient to remove all these inconveniences, and consequently prevent the secondary ophthalmia.

With respect to the diet, this ought, in the

greater number of patients, to be of the lowest kind, and for the first twenty-four hours should consist of broths only. Persons, however, who are much debilitated, or subject to convulsions, and elderly people, are exceptions to this rule, as a very rigorous diet in such cases might occasion a return, or aggravation of the nervous symptoms. In these instances, therefore, it is necessary to allow some soup in addition, and liquid food, which should be given at short intervals.

It is not necessary, without particular reasons for doing it, to open the eye which has been operated on, and consequently expose it to the light before the 3d day after the operation. It is useful, however, to separate the eyelids gently, morning and evening, and to wash their edges and the cilia with a sponge dipped in pure water, in order to prevent their cohesion.

In cases of *cataract* in both eyes, I have learnt from experience, that it is not advantageous to operate upon them immediately one after the other; but that it is better to wait till the first is well, before the operation is attempted upon the other; the delay makes little difference in the time required for the cure of both. Upon this point I have had frequent occasion to remark, that the symptoms of the second operation, whether upon the same eye, or upon that which has not been operated on, are constantly less considerable than those of the first operation. Whether this arises from the tranquillity of the patient's mind, from having experienced the little inconvenience consequent on the operation of couching, or that each

eye becomes less sensible to the puncture of the needle, and the motions of the instrument, after one of them has once suffered the irritation produced by it, I am unable to decide. This I know, that I have frequently seen in women subject to hysteria, and in hypochondriacs, after the easiest and most successful *depression* of the *cataract* in one eye, convulsive symptoms excited either general or confined to the head and the eye which had been operated on; and these, in some cases, so violent, as in a short time to leave the pupil dilated and immoveable, with almost total insensibility of the optic nerve of that side; while in the same patients, when the other eye has been operated on two weeks afterwards, it has not been followed by any remarkable accident.

If there be no symptoms of any consequence to combat, which is most commonly the case when the operation is executed in the manner here recommended, in general, on the 10th or 12th day from the operation, the patient is in a state to make use of his eye; which, however, he should do with caution, particularly at first, that is, without fatiguing it too much, or exposing it suddenly to a vivid light.

I consider it useless here to relate any history of cases of *cataract*, which have been perfectly cured by means of couching, and by the method here recommended; or to deliver a detail of facts relative to the cure of *caseous* or *milky cataracts*, which, after the operation, have been dissolved in the aqueous humor, and then absorbed by the powers of nature; since a great number of these facts are

to be found in surgical works, in which these subjects are particularly treated. I shall only add a few cases of *secondary membranous cataract*, the result of which may not be useless in proving the efficacy of the means which I have proposed in the treatment of this species of the disease; which I do the more willingly, as it is to this point that the arguments of those principally refer, who instruct, that in the treatment of the *cataract*, the operation of *extraction* ought to be preferred to that of *depression*.

CASE LIV.

A peasant, 50 years old, whom I had couched three years before, with complete success, for a *cataract* of the left eye, requested to have the operation performed upon the right. The *cataract* on this side appeared to be of a favourable kind, that is, firm and resisting to the needle, as that of the left eye had been; the pupil moved freely, and the patient, notwithstanding the disease, could distinguish the figures of bodies with this eye. The anterior chamber of the aqueous humor of each eye was almost the largest I ever saw. As the palpebræ of this eye were a little tumefied and gummed, I directed a blistering plaster to be applied upon the neck, and prescribed the frequent use of the vitriolic collyrium for a fortnight; by means of which remedies the eyelids recovered their natural state.

I then proceeded to the operation, and although contrary to my expectation, I found the crystalline

somewhat soft, yet by employing some care I was enabled to remove it from the axis of vision, and to bury it deeply in the vitreous humor, freeing the pupil, as far at least as I could discover, from every obstacle to vision.

The operation was unattended with any particular accident; but on the 11th day, when the patient was permitted to leave his bed, and to begin to make use of his eye, he told me, that he could not see so distinctly with it as he had done the first days after the operation. I examined it in a clear light, and found more than half the pupil occupied by a whitish irregular body, of a nature evidently membranous. The iris presented this peculiarity, that at each motion of the eyeball it oscillated and waved backwards and forwards in a peculiar manner.

Without further delay, I introduced the needle again into the eye, and having raised this membranous mass with its point, I found that it was larger than it had appeared to be through the pupil. As it was loosened from every attachment, when I had collected the whole with the point of the needle opposite the pupil, I pressed it forwards, and with the greatest ease made it pass into the anterior chamber of the aqueous humor, which, in this subject, as I have stated, was very large, to the bottom of which it was immediately precipitated, leaving the pupil perfectly clear. The whole of this membranous substance was as large as a barley-corn. In the course of twenty-five days, however, it was dissolved and absorbed, without having occasioned, during its lodgment in the anterior cham-

ber of the aqueous humor, any inconvenience or any impediment to the sight.

From the size and figure of this membranous body, I am inclined to believe, that it was the whole, or the greatest part of the capsule of the crystalline, which, by an unusual combination of circumstances, had been completely detached from the *ciliary zone*, but which, in making the *cataract* describe a portion of a circle, in order to lodge it in the vitreous humor, had been separated from the needle, and remaining behind had afterwards re-appeared beyond the pupil.

CASE LV.

A poor woman, very much emaciated, and subject to hysteria, was received into the practical school on account of a *cataract* in each eye, which she had had for several years. The colour of the *cataract* was blue, but interrupted here and there with whitish streaks, and there was not that convexity behind the pupil which the opake crystalline usually presents. The pupil of each eye was moveable, and the patient could discern the figures of surrounding objects. The circumstances most unfavourable to the operation in this case, were the extraordinary smallness of the eyes, and their being deeply sunk, and more particularly the extreme narrowness of the anterior chamber of the aqueous humor; for, with respect to the general morbid sensibility, I flattered myself it might be allayed by the use of the cinchona with valerian root for

some time, and a more nourishing and strengthening diet than the poor woman had been accustomed to.

After a month's preparation, I performed the operation upon the left eye, and having passed the needle between the posterior surface of the iris and the *cataract*, I perceived, on first fixing and pressing the point of it upon the anterior convexity of the capsule, that this membrane became corrugated, and folded under the instrument; in short, that instead of the crystalline there was only its membranous bag, containing a small quantity of glutinous fluid; which, when discharged, was not in sufficient quantity to render the aqueous humor so turbid as to prevent my proceeding with the operation. This disease would have been denominated by some, *atrophy* of the crystalline. As there was no crystalline lens then, I merely reduced the capsule into small pieces opposite the pupil, making as many of the fragments as I could pass through the pupil into the anterior chamber of the aqueous humor, but I could not succeed in depositing the whole of them in it, on account of its unusual straitness.

Immediately after the operation, the patient, as frequently happens in cases of hysteria, was seized with a violent spasmodic affection of the head; but no sooner was a clyster of the decoction of chamomile flowers, with two grains of opium, administered, than all her pains ceased, nor did any considerable inflammation take place in the eye afterwards.

On the fourth day the patient could see sufficiently well; but her sight afterwards diminished daily, till the eighteenth day after the operation, when she was completely blind, in consequence of the pupil being entirely occupied by a whitish membranous body, formed by the particles and flakes of the capsule, which I had not been able to pass into the anterior chamber of the aqueous humor, on account of its extreme smallness. I then waited a week longer, until the membranous particles and flocculi, which had before been precipitated into the anterior chamber, were nearly dissolved, and left room for the others. I then introduced the needle again into the eye, and very soon freed the pupil from this impediment, by pushing all the membranous flakes into the anterior chamber, so as to fill it on a level with the inferior margin of the pupil. It is a constant fact, worthy of observation here, that those membranous fragments, which, during the first operation, can hardly be caught by the point of the needle, on account of their smallness, after they have been macerated some time in the aqueous humor, swell, and allow of being easily removed or pushed forwards with the instrument.

After the operation, the pain in the head recurred as before, and was relieved in the same manner, by means of an opiate clyster.

About twenty-eight days after the second operation, during which time the woman could distinguish surrounding objects very well, the fragments and membranous flocculi, with which the anterior

chamber of the aqueous humor had been filled for the second time, were entirely dissolved and dissipated, leaving the whole extent of the pupil in its ordinary dilatation, black, clear, and free from every obstacle to the light.

CASE LVI.

Bartolomeo Zucchi, of Calvairate, a robust man, 45 years of age, affected with *cataract* in both eyes, underwent the operation in the school of surgery on the 28th of April, 1793. His eyes were rather small, and sunk in the orbits.

I operated upon the left eye, in which I met with a soft cheesy *cataract*. Having broken the soft pultaceous substance of the crystalline to pieces, I lacerated the capsule very freely all around the pupil; I then passed the whole of the fragments and membranous flakes through the pupil into the anterior chamber of the aqueous humor, which they filled on a level with the inferior margin of the pupil. The operation was not succeeded by any remarkable symptom, and on the tenth day these fragments and flakes were diminished more than one half, and the patient saw distinctly with the left eye.

I now operated upon the right eye, in which, having found a *cataract* sufficiently firm, I was able to lacerate with precision the anterior convexity of the capsule extensively, and to lodge the lens deeply in the vitreous humor. Two weeks after

the operation on the right eye, the membranous particles deposited in the anterior chamber of the left eye disappeared entirely, and the right eye was also capable of bearing the light. The patient was, therefore, soon afterwards discharged from the hospital perfectly cured in both his eyes.

CASE LVII.

Maria Spigoletti, 40 years of age, had had a *cataract* in the left eye for two years, and the crystalline of the right was becoming rapidly opake, the eyelids were swollen and gummed.

She was purged with the magnesia vitriolata, a large blister was directed to be applied upon the neck, and the edges of the eyelids to be anointed morning and evening with the ophthalmic ointment of JANIN.

After three weeks' preparation, I attempted to depress the *cataract* of the left eye, which I found not dissimilar to mucus. Having therefore broken the anterior portion of the capsule, as well as the whole of the membranous sac of the crystalline, into small pieces through the whole ambit of the pupil, I made all the membranous fragments pass through it into the anterior chamber of the aqueous humor, and succeeded so as to render it free from every impediment to vision. A slight inflammation ensued, which was in a great measure confined to the eyelids, but subsided in a week, by merely employing at first bags of emollient herbs, and afterwards the aqua lithargyri acetati composita.

In the course of a month all the membranous fragments deposited in the anterior chamber of the aqueous humor, which had given the appearance of an hypopion, were dissolved and entirely removed, and the woman having recovered the sight of this eye, was discharged from the hospital.

CASE LVIII.

Giovanni Alberti, a countryman, 66 years of age, affected with *cataract* in both his eyes, was admitted into the practical school of surgery for the purpose of undergoing the operation.

I attempted it on the left eye, and found the crystalline sufficiently firm to admit of being easily removed from the axis of vision, and immersed in the vitreous humor. Having accomplished this, I perceived, before the needle was withdrawn from the eye, that there was a portion of opake membrane, or a considerable part of the anterior convexity of the capsule, which had not been sufficiently lacerated, floating behind the pupil. I turned the point of the needle backwards again, and having carefully broken this membrane as far as the circumference of the pupil admitted, I forced the whole of the fragments through the pupil into the anterior chamber of the aqueous humor. The patient had no bad symptom, and saw very well with this eye.

Twelve days afterwards I operated on the right eye, and the same thing occurred precisely; I was able to dislodge the opake lens readily, but a bor-

der of the anterior portion of the capsule remained behind, opposite the pupil, that is to say, the capsule was lacerated with the needle, but not so completely as to remove this portion of membranous veil. I therefore turned the point of the needle, as in the first instance, towards the membranous border, which I lacerated in pieces, and as I detached the portions of it, I pushed them through the pupil, and precipitated them into the anterior chamber of the aqueous humor; and this I repeated until the whole circumference of the pupil appeared black. About a month after the operation on the second eye, there was no vestige of membranous particles in the anterior chamber of either eye, and the patient completely recovered his sight.

CASE LIX.

Paola Guagnini, of Sale, aged 45, weak, and subject to violent attacks of hysteria, had been affected for several years with a *cataract* of the left eye, and saw indistinctly with the right, from an incipient opacity of the crystalline on that side. The conjunctiva of both eyes was also in some degree relaxed, and the eyelids tumefied and gummed. I therefore directed a blistering plaster to be applied upon the neck, and the vitriolic collyrium to be frequently instilled into the eyes for a fortnight; by these means the eyelids subsided, and the immoderate viscid discharge ceased. On account of the patient's great irritability and weakness, I ordered her to take ℨj of the cinchona, and

℈j of valerian root, twice a day, during the whole of this time.

On the 21st of November, 1795, she submitted to the operation. At the moment the point of the needle was pressed upon the *cataract*, in order to remove it from the axis of vision, it burst like a small bladder, and a milky fluid gushed out, which rendered both the chambers of the aqueous humor turbid. Notwithstanding this, I could distinguish the nucleus of the opake crystalline through this cloudy fluid, which I conveyed deeply into the vitreous humor: then conducting the point of the needle again towards the pupil, I detached and lacerated the anterior hemisphere of the capsule into several pieces, and passed these membranous portions in succession through the pupil into the anterior chamber of the aqueous humor.

The patient did not complain of any acute pain during the operation, and passed the three following days without uneasiness. On the fourth day she was seized with a violent hysterical paroxysm, with a sense of suffocation, agitation of the whole body, delirium, and incoherent talking, which made me fear some unfavourable effect on the eye operated upon. There was, however, no alteration, and contrary to my expectation, I found the day after this accident that the pupil was clear, and that the woman could distinguish the most minute objects.

On the tenth day from the operation the patient was in a state to leave her bed, and to begin to use her eye in a moderate light.

The mass of membranous flakes precipitated into

the anterior chamber of the aqueous humor, which resembled an *hypopion*, began to be dissipated, and in the space of thirty-two days the whole sediment of the particles was entirely absorbed, and the patient was discharged from the school of surgery perfectly cured. The uninterrupted use of the cinchona with valerian root, and a few spoonsful a day of the infusion of chamomile, with the aqua ammon. succinat. and the aqua canellæ, had rendered the hysterical attacks less violent and frequent than before.

CHAP. XVI.

OF THE ARTIFICIAL PUPIL.

When I published this work in 1801, I confined myself to the description of a new method of executing the operation for the artificial pupil, in those cases of closure of the natural pupil only, which takes place after the most complete *depression* or *extraction* of the cataract; and consequently without any complication arising from opacity of the cornea or of the crystalline lens or its capsule. The operation which I proposed, under particular circumstances, appeared to me at that time preferable to those of Cheselden, Janin, or Wenzel; first, because I considered it, in this simple form of the disease, to be more easily and safely executed than the former of these methods of operating; and secondly, because it did not require as in the other two, the division of the cornea, in the manner practised for the extraction of the *cataract;* an operation, which, on account of the great extent of the incision required in proportion to the circumference of the cornea and volume of the crystalline to be extracted, is frequently followed by serious consequences, particularly in irritable and aged persons.

Experience, to which all theory is subordinate, has since convinced me, that, independently of the mode of operating, which I proposed, being inapplicable, of which I was aware, to the greater number of

complicated cases of closure of the *pupil*, I was also mistaken with regard to the most material point in the operation, that is, the *permanency* of its success; as I have since found that the *marginal* pupil, or opening which is formed by the detachment of the greater circumference of the iris from the ciliary ligament, from being *oval*, becomes, in process of time, *filiform*, and consequently useless.

In order to avoid this inconvenience, Donegana*, one of my ablest pupils, proposes very ingeniously, in addition to the detachment of the great margin of the iris from the ciliary ligament, to make a transverse division of this membrane equal to its semi-diameter, from which an aperture would result of a triangular figure, the base of which would be at the ciliary ligament, and its apex at or near the centre of the iris. For this purpose he had a curved needle made with a cutting edge of a falciform shape, with which, having passed it into the eye, either through the sclerotica, as in the operation for depressing the cataract, or through the cornea, or through both these parts, according to the variety and complexness of the case, he proposed to separate the iris, as already stated, from the ciliary ligament to a certain extent, and afterwards to divide it transversely equivalent to its semi-diameter. By this mode of operating he had some degree of success, particularly with regard to the *permanency* of the new pupil, but not such, indeed, in most respects, as to inspire others

* Della Pupilla Artificiale Ragionamento, Milano, 1809.

with a full confidence that this modification would deserve to be held up as an operation easily and safely executed, as well as applicable to the variety and combination of circumstances with which the obliteration of the natural pupil is so frequently aggravated.

The iris, in consequence of its soft and distensile texture, and having no firm point of support either before or behind it, does not afford sufficient resistance to the knife to allow of being cleanly divided in the precise direction and degree which the operator proposes. And less adapted to this purpose is a needle bent at the point, of a falciform shape, which, by pressing rather than gliding upon the soft and yielding membrane, only slightly wounds it in reality with its point at the moment when it is about to be withdrawn; hence it most frequently follows, that while the operator proposes to make a transverse incision in the iris, either to the whole or one-half its diameter, he finds it only divided to a very small extent, and the operation thus rendered fruitless; or, if he persist, it ends in his completely detaching this membrane from the ciliary ligament.

FLAJANI states*, that he has made a pupil by dividing the iris *crucially* with a double-edged needle introduced through the cornea, which, I presume to have been perfectly transparent, and unaccompanied with opacity of the lens or capsule. This operation, however, following the steps laid down by the author, is not, in my opinion, practicable in all its parts. For when the needle is intro-

* Collezione di Osservazioni, t. iv. page 129.

duced into the anterior chamber of the aqueous humor, and has perforated the upper part of the iris, a vertical division of this membrane can only be made by pressing the instrument from above downwards, and withdrawing it at the same time from the eye, in consequence of which the iris is carried forwards by the pressure of the needle towards the concavity of the cornea. In the second stage of the operation also, or in making the transverse incision in it; as the aqueous humor is almost entirely discharged, it is very difficult to replace the sharp and pointed needle a second time in the anterior chamber, where the iris is nearly in contact with the cornea; and still less after this is accomplished, can the instrument be moved in a transverse direction so as to divide this membrane *crucially* through its whole diameter.

Sir W. ADAMS has lately undertaken to demonstrate not only the practicability but the advantage of forming an artificial pupil after the manner of Cheselden*, which for a long time has been regarded by the best practitioners as ineffectual, and of uncertain issue. For this purpose he has employed a small knife similar to the dissecting scalpel, with a sharp and slightly convex edge, about a line broad and eight in length, with which, having introduced it into the eye through the sclerotica, as in the operation for depressing the cataract, he has divided the iris transversely, nearly as Cheselden did, and thereby obtained an opening sufficiently large to enable him to push the frag-

* Practical Observations on Diseases of the Eye.

ments of the capsule or opake crystalline accompanying the aperture of the pupil through it into the anterior chamber of the eye, where, being liquefied by the solvent power of the aqueous humor, they were afterwards absorbed.

It appears to me from all that I have observed on this subject, admitting the great dexterity and success of this eminent oculist, advantages which are not commonly possessed, that his knife is not exempt from a great number of the defects which are found in the employment of the cutting needle passed into the eye through the sclerotica, particularly when the anterior chamber of the aqueous humor, which frequently occurs, is small, and where a straight needle or knife can with difficulty be moved in a curve without its point being entangled in the substance of the cornea. Nor, indeed, am I able to discover any remarkable difference between a large lancet-shaped needle very sharp at the edges, and a knife of equal size. The author ingenuously allows that he has not always been able to make a transverse incision in the iris of sufficient extent, without being obliged to repeat it a second and third time*, which it is not easy to do on account of the great difficulty of continuing the incision in the same line, especially if the patient is restless, and the eye, from the repeated movements of the needle or knife, is at all flaccid or turbid. He positively says, also, that

* Loc. cit. p. 56. With the improved knife I now use, which cuts as sharp as a lancet, I have very seldom succeeded by the first incision, but have repeated it in the manner already described until the aperture in the iris is of a proper size.

the new pupil contracts so as to become of little or no use, if the incision in the iris does not extend across two-thirds at least of its transverse diameter. Occasionally as appears from the author, on account of the great softness and extensibility of the iris, and the want of a sufficient point of support in the vitreous humor, the knife makes only a small opening in the iris, or two punctures with a narrow part connecting them*; and sometimes for the same reasons, when the iris has been divided, the capsule of the crystalline having become, from long opacity, thicker and firmer than ordinary, in consequence of previous *acute internal* inflammation, is not readily cut through at the same time with it. But if, unfortunately, in the first attempts, the iris being stretched rather than divided by the knife, is separated, even in the slightest degree, from the ciliary ligament, it becomes absolutely necessary to desist from the operation, as, by persisting, the iris is more liable to be detached completely from the ciliary ligament, than to admit of being divided to the smallest extent†. And this separation must happen the more easily in attempting to form a *lateral* pupil by a *vertical* incision in the iris near its great circumference, by pressing the knife from the upper to the lower part of the eye, as the author proposes, an operation very easy in theory, but of

* Loc. cit. Case VI.

† For if this should once occur, it will be impossible to effect a central aperture afterwards; the separation of the iris being increased by every further effort to accomplish the former object. Page 57.

very difficult execution in practice. And with regard to the *permanency* of the new pupil made by a simple transverse incision in the iris, the author appears, to my mind, notwithstanding, to entertain some doubt on it; as he lays it down as a good maxim to be followed, that the operation should be completed by introducing between the lips of the wound in the iris some of the fragments of the capsule or opake lens, in order that these bodies, during the time necessary for their dissolution, should act as a sort of wedge, and consequently oppose the tendency which the margins of the divided iris have to approximate. I am not however unwilling to believe, that in those cases of closure of the pupil which have been preceded by *procidentia* of the iris through an ulcer or wound of the cornea, and in which a border of this membrane has been drawn into the cicatrix, and remained adherent to it, the iris may offer sufficient resistance to the knife, being retained anteriorly by its attachment to be readily and cleanly divided; and in such cases, I am inclined to believe, that a simple transverse incision in the iris alone may form a *permanent* artificial pupil, in as much as one of the lips of the wound cannot be separated from the point of union which it has contracted with the cornea. And what more particularly confirms me in this opinion, is that of the successful operations of this kind executed by Sir W. Adams, nearly half of them were on patients who were affected with *protrusion* of the iris.

No one has, perhaps, more ardently wished than

myself the discovery of some mode of forming an artificial pupil, without the necessity of recurring to the division of the cornea*; from which, on account of the extent of it, compared with the circumference of the cornea, I have always apprehended serious consequences; but after repeated attempts, and a more mature examination of this important subject, reason and experience have fully convinced me, that, on account of the soft texture and great extensibility of the iris, and its want of sufficient support on both its sides, an accurate and safe division of it can only be made in the precise degree and direction which the variety or complexness of the case demands, by means of the scissors. And experience has also proved that in order to obtain, with the most absolute certainty, a *permanent* artificial pupil, it is necessary to make two incisions in the iris so as to form a triangular flap in this membrane; all which it is obvious cannot be executed, without previously to the division of the iris by means of the scissors, an incision being made in the cornea of requisite proportion, but of as small an extent as possible.

These points being established, which I consider as fundamental with regard to the *artificial pupil*, the primary indications to be drawn from them, which the surgeon ought to fulfil in order to perform the operation with speed and safety, whether in simple or complicated cases, are the following.

The use of the scissors for making an opening in the iris with exactness and certainty rendering a division of the cornea indispensable, to do it in such a manner as to include as small a part of the circum-

* Bibliotheque Britannique, t. 50—53.

ference of that membrane as possible, and far less than is usual in the extraction of the cataract. To divide the iris with the scissors in such manner that, guarding against the smallest separation of it from the ciliary ligament, a small triangular flap may be formed in it, and as much as possible in its centre. That the new pupil, as far as is practicable, may be in the centre of the iris, or at least at such a distance from the ligament and from the corpus ciliare, that the latter may not be an obstacle to vision.

From these premises, which I consider as incontrovertible, it will be easy to form a judgment of the advantages or disadvantages of the methods hitherto proposed for executing this operation, among which, the most reputed are those of Janin, Wenzel, Beer, Gibson, and Maunoir.

Janin, after making an incision in the cornea as extensive as that used for the extraction of the cataract, introduced a pair of curved scissors into the anterior chamber of the eye, with which he perforated and divided the iris *vertically* at one stroke, near to the centre of this membrane.

Wenzel, by a single stroke of his bistoury, divided the cornea and iris at the same time, removing afterwards a portion of the latter by means of the scissors, for the purpose of leaving a large and permanent pupil in it.

Beer, after opening the cornea in the manner before-described, draws the iris towards him by means of a fine hook, and removes the small portion of this membrane which protrudes from the cornea.

Gibson proposes, after the usual division of the cornea, to obtain a protrusion of the iris from it by means of pressure on the eyeball, similar to the *pro-*

cidentia, and then to remove the projecting portion of it close to the cornea.

Now on comparing attentively these modes of operating with the principles above laid down, and the indications manifestly deduced from them, it appears clearly, that there is one disadvantage common to all of them, the too extensive a division of the cornea, to which are principally to be attributed the ill consequences, attending both the extraction of the cataract and the formation of the pupil, as violent *acute* inflammation of the eye both *external* and *internal*, the *procidentia* of the iris, and the *sloughing* [*mortificazione bianca*] of the cornea. The *vertical* division likewise of the iris according to the method of JANIN, although executed with the scissors, has been observed in process of time from being *oval* to become *filiform* in the same manner as the *marginal* pupil made by the detachment of the great margin of the iris from the ciliary ligament. And it was undoubtedly in order to avoid this inconvenience, that WENZEL, BEER, and GIBSON considered it necessary to take away a small portion of the iris. But it is easy to foresee that this harsh mode of operating, whether by drawing the iris, pressing upon the eyeball, or removing a portion of it, must in the greater number of cases be attended with bad consequences. In practising any of these methods, it is also impossible to avoid the disadvantage of the new pupil being always formed opposite the cicatrix made by the division of the cornea, a part not always exempt from a certain degree of opacity around it. And with regard to the operative process of GIBSON, this is impracticable when

the iris has formed an adhesion to any part of the concavity of the cornea. And if in addition to the closure of the pupil, there is adhesion of the opake capsule of the crystalline to the posterior surface of the iris, which is not unusual, the latter is so firmly held back that it is difficult, if not impossible, by pressing upon the eyeball to make it project beyond the cornea so as to be enabled to remove a portion of it by the scissors.

MAUNOIR, the celebrated surgeon and professor of anatomy in Geneva *, is the only one in my opinion who has formed a just estimate of these general principles, and at the same time discovered the means of carrying the indications successfully into effect, not only in simple cases but in those accompanied with other affections of the eyeball. In order to attain the object proposed, this learned and expert oculist has had scissors † made of a delicacy and fineness hitherto unequalled in the construction of surgical instruments. The blades of the scissors are slightly inclined to the handle. The upper blade, or that which is designed to pass through the anterior chamber of the aqueous humor between the concavity of the cornea and the iris terminates in a small button. The lower blade for perforating the iris and advancing along the posterior surface of this membrane, has a very sharp point similar to that of a lancet. The thickness of the two blades united does not exceed that of an ordinary fine probe.

* Mémoires sur l'organisation de l'iris, et l'operation de la pupille artificielle. Paris, 1812.

† Plate III. fig. 8, 9.

The mode of operating with it, as is practised by Professor MAUNOIR with great success and which has been advantageously repeated in this Hospital, is as follows.

The patient being placed horizontally with his head a little raised, a position no less commodious in the operation for the extraction of the cataract, than the formation of the pupil, and supposing the cornea to be perfectly transparent, and the capsule and lens in the case of cataract to have been completely removed from the axis of vision, an incision is made in the cornea at its lower or lateral segment, as may be most convenient, of *half the extent* of that which is usually made for the extraction of the crystalline lens. Through this small opening in the cornea, the scissors are to be introduced closed, with the flat part in a line parallel to the transverse diameter of the iris; and as soon as the point of the instrument has advanced near to the great margin of the iris, that is to say, nearly opposite the small incision made in the cornea, it is gently opened and inclined in such a manner that the inferior pointed blade may perforate the iris and run along the posterior surface of that membrane, until the small button of the upper blade has reached the part where the cornea and sclerotica unite. The iris is then to be divided in its transverse diameter by a single stroke passing as nearly as possible through its centre. This incision being executed, another is to be expeditiously made so far diverging from the first that the two incisions may form in the centre of the iris a triangular flap of the figure of the letter V *, the apex being precisely in the centre of the iris and the base

* Plate II. fig. 13.

near its greater margin. The operation being completed in this manner, and the eye suffered to remain at rest for some minutes, in order to allow time for the reproduction of the aqueous humor, there being no obstacle on account of the capsule or opake lens behind the iris, the patient is able to distinguish the objects which are presented to him. On opening the eye operated on five or six days after, the apex of the triangular shred is found to have retracted towards its base, leaving in the middle of the iris an artificial pupil of the figure of a *parallelogram* *, or of a *crescent* with the cornua directed to the great margin of the iris † when the apex of the divided portion has not completely shrunk towards its base. One or other however of these two forms of artificial pupil equally conduce to the restoration of sight.

This method of operating possesses an evident superiority over all those before mentioned. The incision in the cornea being half the extent of that which is made for the extraction of the cataract, and consequently small, this most important part of the operation is very easily executed even by an inexperienced operator. The reunion and healing of the wound are also, on account of the smallness of the incision, proportionally more speedy, which is an advantage very material to its success. The double incision in the iris by means of the scissors is expeditious and safe in every complication of circumstances, as the collapsion of the cornea from the discharge of the aqueous humor presents no obstacle to the passage of the upper blade between the

* Plate II. fig. 12.
† Plate II. fig. 11.

cornea and iris on account of the point being furnished with a button. No stretching nor laceration is made in the iris, which although soft, very distensible and deficient in support, is cleanly divided in its natural position to a greater or less extent according to the will of the operator. No portion of the iris is removed. The effusion of blood into the eye is inconsiderable, compared with that occasioned by the detachment of the iris from the ciliary ligament, or by the excision of a small portion of that membrane. Besides, as will be presently shewn, in cases of partial opacity of the cornea, it is of considerable advantage to be able to make the new pupil in that part of the iris which is opposite the transparent part of the cornea and always remote from the cicatrix produced by the incision in it, and at a proper distance from the corpus ciliare, so that the latter may not form an impediment to the transmission of light to the bottom of the eye. Lastly, in consequence of a double incision in the iris in the form of the letter V, the pupil resulting from it, continues ample and *permanent*.

The closure of the pupil is not unfrequently accompanied with partial opacity of the cornea. This kind of complication does not require much variation in the method of operating. For the diversity in the seat of the opake part only obliges the surgeon to vary the situation and direction of the incision in the cornea, so that the new *lateral* pupil may be always opened at a distant part to that in which the incision of the cornea has been made, and opposite the portion of it which has preserved its transparency. If the speck therefore occupy

that part of the cornea next the nose, the incision should be made in the lower segment, but a little higher on the side next the caruncle, so that the new pupil may be opened towards the temple as much as possible in the direction of the transverse axis of the iris. And in operating on the left eye, if the surgeon is not ambidextrous, especially in the management of the scissors, he should place himself laterally or behind the patient's head, at the time of dividing the iris. But if the opacity is situate on the external segment of the cornea or on the side next the temple, the cornea should be divided at this part but a little lower, by which the artificial pupil will be formed on the side next the nose and nearly in the transverse axis of the iris. It is in all instances an invariable rule that the incision be made in the opake portion of the cornea, as experience has proved that the opacity and preternatural density of this membrane does not prevent the coalition and healing of the wound made in it. Another rule no less important to be followed in these cases than the preceding, is, that, the *lateral* pupil, although necessarily instituted in the semidiameter of the iris, be always at a sufficient distance from the corpus ciliare, that this part may not render the operation useless by intercepting the passage of the light through the new pupil.

All who are acquainted with the structure of the eye, know that the corpus ciliare with its processes is prolonged from the ciliary ligament to the circumference of the capsule of the crystalline lens behind the great margin of the iris extending to about a fourth of the length of the semidiameter of

this membrane from the ciliary ligament towards the centre of the iris; every artificial pupil, therefore, which is not made at such a distance from the great margin of the iris, and consequently from the corpus ciliare, that the apex at least of the triangular aperture may correspond directly to the circumference, which would have been occupied by the capsule of the crystalline, must be useless. The facts which are cited of a contrary kind, as that published by Demours * prove only that by a rare union of favourable circumstances, an operation, the least rational and methodical, may be successful in the result, but can never serve as a general rule. The thickness of the corpus ciliare, its want of contractility, its great vascularity, and ready intumescence, the great difficulty of being able to cut out and remove a portion of this dense vascular body from behind the great margin of the iris, where it cannot be sufficiently seen by the operator, even after the artificial pupil is formed, are weighty and manifest reasons not to place any confidence of success in the formation of the lateral pupil in the proximity of the great margin of the iris.

The contraction of the natural pupil is sometimes occasioned by the iris and pupil being stretched towards some point of the cornea. This happens in general in consequence of *prolapsus* of the iris through ulcers of the cornea, or after the incision made in this membrane for the extraction of the crystalline lens. This affection is most frequently accompanied with partial opacity of the cornea around the part occupied by the *procidentia* of the

* Extrait du Journal de Med. 26 Prairial, An. II.

iris as well as of the capsule and lens; at other times, however, these internal parts preserve their natural transparency, notwithstanding the deviation of the natural pupil. In the latter case, which is precisely that now under consideration, the pupil removed from its situation, is not in reality obliterated, but merely very much contracted and incapable of admitting the quantity of light necessary for vision, especially if the cornea opposite to it is slightly opake.

To remedy this morbid state, it is necessary to have the scissors of Maunoir made with the points of both blades terminating in a button. A small incision being made in the cornea at the most commodious part, according to the rules before laid down, and the scissors introduced closed, an attempt is to be made to free the adhesion which the iris has contracted to the cornea by them; which, if it is effected, the natural pupil in general recovers its former situation and size; but, if the adhesion of the iris to the cornea is very firm, the operation is to be completed in the following manner. One of the blades, by means of the small button, is introduced within the contracted natural pupil*, and conducted behind the posterior surface of the iris, until the other blade, defended in the same manner, has reached the confines of the cornea with the sclerotica. The iris is then to be divided in the form of the letter V, without at all injuring either the capsule or lens, both of which have preserved their transparency. It is asserted by some

* This mode of operating is equally applicable to those cases of simple contraction of the pupil, unaccompanied with *prolapsus* of the iris and opacity of the capsule and lens.

able operators, and men of careful observation, that in this case, a simple incision alone is requisite, in order that the pupil may recover its proper size, and maintain it, provided, however, that such incision strictly include the *orbicular* muscle of the natural pupil.

Sir W. Adams, in the case now mentioned, proposes to separate the iris from the cornea, and to alter the situation of the natural pupil, by drawing it towards that part of it which has remained transparent. And in order to effect this, he proposes to make a puncture in the cornea with his knife, at the distance of about a line anterior to the iris, and to liberate its adhesion to it; then to make the liberated portion of the iris protrude again through the puncture made by the knife in the form of *procidentia*, and even to draw it out further, if necessary, with the forceps, and to suffer it to remain there. I leave it to the judgment of practitioners which of the two modes of operating in this case merits the preference. I must only be allowed to say, that a second prolapsus of the iris in the same eye appears to me of itself a very serious disease, and rather calculated to increase the opacity of the cornea, and augment the contraction of the pupil, than to remedy the disorder.

So far I have thought it proper, in order to treat this subject with as much clearness as possible, to consider the closure of the pupil as an unfortunate event, ensuing after the most exact and complete operation for the cataract; that is to say, without any obstacle to the sight remaining dependent on the capsule or opake lens,. although in reality this

combination of circumstances is not the most frequent. I come now to mention those complications which are the most weighty, depending on the presence either of the opake capsule only, or of the capsule and lens together, and also of those in which the capsule has formed an adhesion to the posterior surface of the iris, pointing out at the same time what modifications of the operation are in such cases necessary.

The acute *internal* ophthalmia, which sometimes succeeds the incomplete operation for the cataract, or when the capsule has not been removed, produces a contraction of the pupil, and afterwards an opacity, thickening, and finally adhesion of the capsule to the posterior surface of the iris, in consequence of which, after the inflammation has ceased, the pupil remains corrugated, narrow, and incapable of being dilated, either by the stimulus of light,* or of the extract of Belladonna introduced between the eyelids. The same disorder takes place, also, independently of the operation for the cataract, whenever the violence of the internal ophthalmia, whether produced by internal or external causes, destroys the transparency of the capsule, and from the effusion of coagulable lymph into the eye consequent on it, this membrane becomes adherent to the iris.

In general, when the closure of the pupil is associated with adhesion of the opake capsule to the posterior surface of the iris, in the middle, or apparently in one of the segments of this membrane, if the disease have been preceded by *procidentia*, a whitish or yellowish corrugated point, or traversed

as it were by minute filaments, is observable. It is however uncertain, when the operation for cataract has not been performed, whether behind the opake capsule the crystalline is transparent or not; though in my opinion this is of little consequence; for, if the operation for the formation of a new pupil be requisite, as the capsule must be removed, the crystalline lens must of necessity be also dislodged from its situation. Besides, the crystalline being isolated and loosened from its capsule, cannot remain in its natural situation, however desirable it might be to preserve its transparency.

The probability of the success of the operation, in cases accompanied with opacity and adhesion of the capsule to the posterior surface of the iris, is to be determined principally by the power which the patient still retains of distinguishing with the affected eye light from darkness. And with regard to the operation, it is in vain to expect that the capsule of the crystalline adhering to the iris, can be detached by a straight or curved needle passed into the eye through the sclerotica, as in the depression of the cataract, and the natural pupil thereby freed from the presence of this opake membranous body, which closes it even more completely than had been done by the previous inflammation. Experience has already decided upon the insufficiency and disadvantages of such an attempt; first, because the point of the needle can only be moved within the eye by guess; and if it should be entangled in the iris, as well as the capsule, it would more easily detach the iris from the ciliary ligament than the capsule from the iris. In the second place,

because, if even the operator should succeed in detaching some portions of the capsule, the constriction of the natural pupil remaining as before, would prevent him from completing the operation in an attempt to pass the rest of the capsule or crystalline, if this should be found in its situation, into the anterior chamber of the aqueous humor. A more expeditious and safe method of executing the operation under these circumstances is, in my opinion, the following. An incision of moderate size should be made in the cornea, either at the lower part, or a little inclined towards the nose or temple, if the partial opacity of the cornea render it necessary, and, if possible, without making use of a *speculum oculi* of any kind. With the sharp-pointed blade of the scissors, the iris should be perforated at a small distance from its great margin, that is, nearly opposite the external wound, and pressing it further inwards towards the longitudinal axis and bottom of the eye than usual, at once pass it beyond the opake capsule and the crystalline lens, if it is found there. Both the blades having reached the side opposite to that which they entered, all the parts should be divided at one stroke, that is, the iris, the opake capsule, and the crystalline, and without delay, after the first incision, a second should be made diverging from the first, so as to leave a large aperture in the iris in the form of the letter V. Through this large opening in the iris are immediately discerned the broken portions of capsule and opake crystalline. If the portions of the lens are firm, by a slight pressure on the eyeball, they will advance and pass through the new triangular pupil into the

anterior chamber of the aqueous humor, from whence they may be extracted in the same manner as is practised in the cataract. For this purpose, where the lens is broken into fragments, a smaller incision in the cornea is requisite than where the extraction of the crystalline lens is to be made in its entire state. If, however, the crystalline is soft or caseous, the removal of the divided portions of it may be facilitated by means of the small scoop, or of the *eyed* forceps of MAUNOIR, similar to those used for the polypus, but of extreme fineness. In the same manner, with regard to the capsule, the fragments of it may be detached and extracted by means of a very fine hook, or the forceps just mentioned. The portion of capsule, which may have adhered to the small triangular flap in the iris, will form no obstacle to vision, as, in consequence of its adhesion to it, it will retire with this divided portion from the apex to the base of it. Whenever the crystalline, notwithstanding the opacity of the capsule, has preserved its entire transparency, the extraction of the pieces of it will require greater attention than when it is opake, in consequence of these portions of it being confounded with the substance of the vitreous humor.

Notwithstanding the utmost care, it is not uncommon, after the operation now described is completed, and the consecutive symptoms have ceased, to find some fragments of the capsule or crystalline, or of both, concealed in the posterior chamber, appear opposite the new pupil. In this case it will be proper to introduce a fine curved needle through the sclerotic coat into the eye, and by this means

completely detach the particles of capsule, if they are still adherent to the iris, and, either alone or with the fragments of the crystalline, press them through the new pupil into the anterior chamber of the aqueous humor, where, being liquefied by the solvent power of this humor, they finally disappear by absorption.

Among the important advantages which arise from forming the artificial pupil as nearly as possible in the centre of the iris, is to be reckoned that of the new pupil, corresponding by such means to the greater convexity of the cornea, in consequence of which the rays of light are directed in greater quantity than at its circumference towards the longitudinal axis of the eye. This advantage is not gained where there is a necessity of making a *lateral* pupil. In the latter case, therefore, there is more necessity than in the former to have recourse to a convex glass, such as is used after the operation for the cataract, cautioning the patient to accustom himself to place the focus of it opposite the *lateral* pupil*.

* Reisinger proposes to form an artificial pupil by making a small incision in the cornea, and introducing a small double hook, performing the office of forceps also, by which, having fixed it into the iris near its great margin, he advises this membrane to be detached to a certain extent from the ciliary ligament, and to be drawn out of the incision in the cornea, where, by forming an adhesion to the lips of the wound, the retraction of the iris, and consequently the closure of the new pupil, will be entirely prevented. Under certain conditions, however, as the difficulty of drawing the iris out of the cornea, or the doubt that the cicatrix of the wound in it might increase the opacity of this membrane, in making the artificial *procidentia*, he would advise that, be-

sides the detachment of the iris from the ciliary ligament, a portion of it should also be removed. On this subject, see a more minute detail in the *Journal de Med.* par M. Leroux, October, [illegible]. This method of operating, which combines those of Beer and Assalini, is too far removed from that simplicity which marks the perfection of a surgical operation. And it is much to be doubted, whether, notwithstanding the modifications proposed by the author, this process is entirely applicable to all the complicated cases of closure of the pupil; especially that of opacity of the crystalline lens and its capsule, with adhesion to the posterior surface of the iris. Hitherto the facts are neither sufficiently numerous nor successful to prove the contrary. Nor will it be easy to persuade those who are acquainted with the subject, that independently of fixing a hook in the conjunctiva for the purpose of keeping the eye steady, the injury done to the iris can be exempt from consequences most injurious to the organ of vision.

CHAP. XVII.

OF THE STAPHYLOMA.

THAT disease of the eyeball is termed *staphyloma*, in which the cornea loses its natural transparency, is elevated upon the eye, and gradually projects beyond the eyelids in the form of an oblong tumor of a whitish or pearl color, which is sometimes smooth, at other times tuberculated, attended with a total loss of sight.

This disease not unfrequently attacks infants a little after their birth, and is most commonly a sequela of the puriform ophthalmia; or it appears in consequence of the small-pox, and what is extraordinary, never during the eruptive or suppurative stage of that disorder, but on the desiccation of the pustules, and even after the crusts have desquammated.

In a great number of cases, when the *staphyloma* has arrived at a certain elevation upon the cornea, it becomes stationary, or only increases in exact proportion with the eyeball; in others the small tumor gradually increases in all its dimensions, and in such a disproportion, with respect to the rest of

the eyeball, as ultimately to project considerably beyond the eyelids, and occasion great uneasiness and deformity*.

This disease is justly ranked among the most dangerous to which the eyeball is subject; since to the total and irreparable loss of sight which accompanies it, are added the evils which necessarily arise from the augmentation and protuberance of the *staphyloma*, when the tumor of the cornea has acquired such a magnitude as not to admit of being enclosed and covered by the eyelids. For in such cases, the continual exposure of the eyeball to the contact of the air, and the particles floating in it, the friction which the cilia make upon it, and the incessant discharge of tears upon the adjacent cheek, are causes sufficient to occasion the eye to become gradually painful and inflamed, and sympathetically

* I have lately had occasion to see a singular disease of the cornea, in a woman 35 years of age, which, if it be not referable to the *staphyloma*, I do not know in what class of diseases to place it. The eyes were naturally prominent; the cornea of each side, without any evident cause, became elevated in the centre and gradually projected outwards, so that it no longer formed a regular segment of a sphere applied upon the sclerotica, but a pointed cone. When the cornea was viewed sideways, it resembled a small transparent funnel with its base applied upon the sclerotica. In particular motions of the eyeball, the point of this cone appeared rather less transparent than its base, in others not so; but even where it appeared least transparent, it was not in such a degree as to present any considerable obstacle to the sight. When the eyes were placed directly opposite a window, the apex of the cone reflected the light so powerfully, that it had the appearance of a luminous point: and as this took place precisely opposite the pupil, which was now contracted, the woman could only see objects distinctly in a moderate light, in which the pupil was sufficiently dilated; in a strong light her vision was weak and confused.

to affect the sound one; and finally to produce an ulceration of it, together with the lower eyelid and the cheek upon which it rests.

It has long been the opinion of surgeons, that in the formation of the *staphyloma*, the cornea yields to the distension produced by the turgescence of the proper humors of the eye, in the same manner, nearly, as the peritoneum yields to the pressure of the viscera contained in the abdomen when an intestinal hernia is formed. Richter * has opposed this theory, by remarking that the *staphyloma* is most frequently formed without its having been preceded by any of those morbid predispositions which are generally regarded as capable of weakening the texture and elasticity of the cornea; that the cornea, degenerated into *staphyloma*, acquires a much greater thickness than that which it possesses in a natural state, and that consequently the *staphyloma*, instead of being internally concave, is perfectly compact and solid, while it ought to be precisely the contrary, if it were the effect of excessive distension of the cornea from within outwards, with an attenuation of its natural texture.

In conceding to Richter the encomiums to which he is entitled for his distinguished merits in all the branches of the healing art, I cannot but remark on this occasion, that the illustrious author in explaining, as he has done, a matter of fact, relative to the origin and nature of *staphyloma*, has extended his doctrine too far, in making no difference, between the *staphyloma* recently appearing in infants, and

* Observ. Chirurg. Fascicul. II.

that of adult subjects, in which last, the disease has acquired such a magnitude as to project considerably beyond the eyelids. I fully agree with him as to the certain and demonstrable fact, that the recent *staphyloma* in infants is entirely compact and solid from the increased thickness which the cornea assumes in this disease; but it is equally certain, as I have found from repeated observation, that in the *staphyloma*, which originally is perfectly solid and compact, after a series of years, and in persons of a mature age, where the tumor has acquired such a size as to project out of the eyelids, the cornea, strictly so called, is constantly thinner, or certainly not thicker than natural, that is to say, the tumor is not perfectly solid internally, except with relation to its state of fulness, as it contains the iris and the crystalline, and not unfrequently also a portion of the vitreous humor; which parts leaving their natural situation, are pushed gradually forwards to occupy the concavity of the cornea, which is proportionally formed and enlarged.

The cornea of infants, in its natural state, is, in proportion, at least twice as thick and pulpy as that of adults; and consequently the anterior chamber of the aqueous humor is proportionally so contracted, in comparison with that of adults, that in very young infants the cornea may be considered as almost in contact with the iris. Such also is the natural softness, flexibility, and succulency of the cornea in infants at an early age, that when separated from the rest of the eye in the dead subject, and rubbed between the fingers, it loses at least one half of its bulk and thickness, which does not take place

in adults. And the cornea is so pliant and distensile at this early period, that, if in the fine injections of the head, the injected substance is extravasated in large quantity within the eyeball, the cornea, compressed from behind forwards, is considerably elevated in the body of the infant towards the eyelids, which, under such circumstances, never happens in the eyes of adults.

In consequence of this natural softness, succulency, and suppleness of the cornea of infants, as well as from the natural straightness of the anterior chamber of the aqueous humor, it not unfrequently happens, that when they are attacked soon after birth with the *puriform* ophthalmia, or variolous metastasis, the cornea, more readily than in that of adults, gives admission within its spongy texture to the thick and tenacious humor which is propelled into it; by the stagnation and condensation of which, it not only loses at that early period its natural organization and transparency, but also swells, becomes much thicker than natural, and in a short time degenerates into an acuminated, whitish, or pearly tumor, completely solid, without any internal vacuity, and perfectly in contact, and adhering to the iris, to which the cornea in infants, as I before observed, is naturally very closely situated.

In the course of some years, however, the disease undergoes new modifications. For the whole eye increasing in volume in proportion to the age, the iris and crystalline, from causes not fully known, abandon their natural situation, and are continually forced forwards; to which perhaps the preternatural fluidity and turgescency of the vitreous humor

contributes, which, when the disease is of long standing, is constantly found in large quantity, and of a watery consistence. Now these parts, the crystalline and iris, when the cornea is not perfectly hardened and firm, press this membrane insensibly from within outwards, and in time distend it in all its dimensions, so as to cause it to project beyond the eyelids, rendering it at the same time thinner in proportion to the volume and capacity which it acquires. I have never met with a large *staphyloma* protruding from the eyelids in adult persons, which had not originated in infancy; and I have constantly found that the thickness and density of the cornea, both in the living and dead bodies of those who were affected with this disease, were in an inverse proportion to the age. In the inveterate *staphyloma*, which projects considerably beyond the eyelids, the iris may be distinctly seen in different parts of it contained within it; and if this is not equally evident in all the parts of the tumor, it is because the conjunctiva, which externally covers the cornea, and the vessels of this membrane having become varicose, throw over it a stratum of substance of unequal density and opacity. And it is precisely this dense stratum of the lamina of the conjunctiva covering the cornea, which in the *staphyloma* that has arrived at a considerable size and amplitude may easily induce the belief, that the substance of the cornea acquires greater density and thickness in proportion as the tumor increases, whereas quite the contrary takes place, the increased density of the lamina of the conjunctiva, which covers it externally, only supplying in part the

diminished thickness of the real texture of the cornea; a means which Nature providently employs on many occasions, in order to prevent the injuries which some important parts might receive, when deprived of their natural covering, and exposed to the action of external agents. It is not to be presumed, that of the many able surgeons and accurate observers of every age, who have frequently, in the course of their practice, destroyed inveterate *staphylomata* of the largest size, no one should have perceived that in this highest degree of the disease, the cornea, instead of being diminished in thickness, according to the common opinion, is, on the contrary, a body entirely compact and solid internally. On the contrary I find them, when speaking of the destruction of large *staphylomata*, projecting much beyond the eyelids, by means of the ligature, delivering cautions to draw the thread only lightly for fear of the cornea, rendered thin in these cases, being easily lacerated. And GUNZ * relates his having been an ocular witness of such an unfortunate accident, in a case where a ligature had been applied upon the *staphyloma*, by means of a needle and thread.

The doctrine of RICHTER, therefore, with respect to the nature of this disease is true, when confined to the recent *staphyloma* of infants. But it appears to me to admit of exceptions, as it regards the thickness of the cornea, in the *staphyloma* of long standing, which has arrived at a considerable size, and projects out of the eyelids.

* De Staphylom. Dissert. see the Disput. Chirurg. of HALLER.

Some pretend that the sclerotic coat also is subject to *staphyloma*, that is, to a partial distension and elevation of its anterior hemisphere in the white of the eye; others entertain a doubt of the existence of this disease. It has never occurred to me, indeed, even once, to see any tumor or elevation of the sclerotica on its anterior surface, corresponding to the white of the eye, in the form of *staphyloma** ; and on the contrary, what may seem extraordinary, I have twice happened to meet with the *staphyloma* of the sclerotic coat in its posterior hemisphere, in the dead subject, where I do not know that it has been seen or described by any

* I have met with one instance of *staphyloma*, or of a disease at least very similar to it, on the *anterior* part of the eyeball. The subject was a husbandman from the country, 32 years of age. Upon the upper and outer part of each eyeball there was a dark purple coloured tumor, extending from the edge of the cornea backwards, which produced a slight elevation of that part of the upper eyelid corresponding to it. That on the right eye was the largest, and extended backwards about half an inch. Around the circumference of the cornea, on the left eye, there were some smaller elevations similar to it. The sclerotic coat at this part had either become extremely thin, or was entirely deficient. The disease had been increasing during ten years, with slight pain only at intervals, and on the left side he had never felt any uneasiness. The pupil of the right eye was irregular in figure, and his sight was so imperfect that he was unable to find his way. The tumor on the right eye was punctured with a very fine needle, and a considerable quantity of limpid fluid was immediately discharged in a small stream on the cheek, and the part became flaccid and paler. As I had no opportunity of observing the future state of the disease, the fact is merely recorded to prove, that the *staphyloma*, or a diseased condition of the eye nearly approaching to it, is occasionally met with on the anterior part of the eyeball, and that it is accompanied with an altered state of the vitreous humor.—Trans.

other. The first time was in an eye taken from the body of a woman 40 years old, for some other purpose. This eye * was of an oval figure, and upon the whole, larger than the sound one of the opposite side. On the posterior hemisphere of the eye, and on the external side of the entrance of the optic nerve, or on the part corresponding to the temple of that side, the sclerotica was elevated in the form of an oblong † tumor of the size of a small nut. And as the cornea was sound and pellucid, and the humors still preserved their transparency, on looking through the pupil, there appeared within it, towards the bottom, an unusual brightness, produced by the light penetrating that part of the sclerotica, which had become thin and transparent where it was occupied by the *staphyloma*. When the eye was opened, I found the vitreous humor entirely disorganized and converted into limpid water, and the crystalline lens rather yellowish, but not opake. When the posterior hemisphere of the eye was immersed in spirit of wine, with a few drops of nitrous acid added to it, in order to give the retina consistence and opacity, I could perceive distinctly, that there was a deficiency of the nervous expansion of the retina within the cavity of the *staphyloma;* that the choroid coat was very thin and discoloured at this part, and wanted its usual vascular plexus; and that the sclerotica, particularly at the apex of the *staphyloma*, was rendered so thin as scarcely to equal the thickness of writing paper. I knew that the woman, from whom the eye had been taken,

* Plate II. fig. 9.

† Plate II. fig. 9. a.

had lost the faculty of seeing on that side some years before, during an obstinate ophthalmia, attended with a most acute and almost habitual pain in the head.

The same observation I had an opportunity of making on an eye, accidentally taken from the body of a woman 35 years of age, and politely sent to me from Milan by Dr. MONTEGGIA, who has distinguished himself by his excellent medical and surgical writings. This eye was also of an oval figure, and larger than the opposite one *. The *staphyloma* of the sclerotic coat † occupied its posterior hemisphere on the external side of the entrance of the optic nerve, or on the side next the temple. The vitreous humor was converted into water; the capsule of the crystalline was exceedingly turgid, with a whitish diluted fluid; the crystalline, yellowish and less than natural; the retina, deficient within the *staphyloma*; the choroid and sclerotic coats, forming the tumor, were rendered so thin as to admit the light. Dr. MONTEGGIA could not furnish me with any thing positive respecting this woman's sight before her death. It is remarkable, that in both the cases now described, the *staphyloma* of the sclerotic coat was situate on the external side of the entrance of the optic nerve. Further observations may, perhaps, hereafter enable surgeons to establish the diagnostic symptoms of the *staphyloma* of the sclerotic coat; but from its deep situation and the nature of the

* Plate II. fig. 10. † Plate II. fig. 10. a.

disease, I doubt very much whether the art will ever arrive at an effectual method of arresting its progress, much less of curing it.

Returning to the *staphyloma* of the cornea, as this part of the eyeball, in such cases, is rendered irremediably opake, the aim of the surgeon in the treatment of this disease, when recent and in infants, must be necessarily confined to prevent the disorganized tumor of the cornea from increasing in size, and to depress and flatten it as much as possible; and in the large inveterate *staphyloma* projecting beyond the eyelids, to effect such a reduction of its size, that it may re-enter and be deeply lodged within the orbit, so as to allow an artificial eye to be fixed, and thereby lessen the deformity of the countenance.

In recent cases of *staphyloma*, Richter proposes to produce an artificial ulcer upon the base of the tumor of the cornea, by means of the reiterated application of the argentum nitratum or the antimonium muriatum, and to keep it open by the repeated use of these caustics; in order to evacuate by means of this small cauterization, the thick and tenacious humor, which is the immediate cause of the opacity and preternatural tumefaction of the cornea. The author asserts, that he has frequently obtained a diminution of the *staphyloma* by means of this small drain made in the substance of the cornea, and in one particular case, that he has even restored the transparency of the cornea; an instance of a cure which has always appeared to me one of the most extraordinary and wonderful of the

many which are found recorded on the diseases of the eyes; particularly as it was completed in fourteen days. "*Ter repetita operatione, quarto scilicet, septimo et decimo die, ne vestigium quidem morbi die decimo quarto supererat**."

I am sorry to be obliged to declare, that although I have frequently adopted this method of treatment in the recent *staphyloma* of infants, and that with the fullest confidence of success, not only from a persuasion that this plan of treatment proceeded from certain and evident premises founded on the nature of this disease, when recent and in subjects of an early age, but, because in so doing, I was guided by one of the most authentic writers in surgery; yet I have never had the gratification to obtain such success, either with regard to restoring the transparency of the cornea, or diminishing the size of the *staphyloma*, as to be in any degree compared with that obtained and recorded by Richter. In three children, one a year and a half old, and the other two, little more than three years of age, recently attacked with *staphyloma* in one eye, in consequence of the small-pox, in which I excited and kept open a small ulcer at the basis of the cornea, by means of the argentum nitratum, for more than thirty days, I derived no advantage from it with respect to the diminution of the tumor, and still less with regard to the opacity of the cornea. In a boy five years of age, who had been a short time affected with a *staphyloma* in one eye, after a violent *chemosis*, having produced an ulcer upon the basis of the cornea, by penetrating with the

* Observ. Chirurg. Fascic. II.

flat point of a lancet, to a small depth into the disorganized and tumid substance of it, and afterwards keeping the ulcer open for five weeks, by means of a solution of the argentum nitratum I observed that the *staphyloma* was a little depressed, and had lost the acute point which it had in the centre*, but the cornea remained every where opake as at first. In two other subjects, nearly of the same age, under the same circumstances, and treated in the same manner, although the ulcer of the cornea was kept open for fifty days, I could obtain no depression or diminution of the *staphyloma*, and consequently the pointed tumor in both remained of a pearl-colour, as at first.

If, even by means of further trials made by persons of ability, this plan of treatment should, under particular circumstances, be found to be advantageous, not with a view to re-establish the transparency of the cornea, but merely to restrain and depress the recent *staphyloma* of infants, I am of opinion that it will not be easy to produce a persuasion that the same mode of treatment can ever be of utility in obtaining a diminution of the size of the inveterate *staphyloma* in adult persons; or that which protrudes beyond the eyelids and presses upon the cheek. For what advantage can be expected from an artificial ulcer made in the substance of the cornea, which is no longer soft and pulpy, nor thickened merely by a tenacious humor effused into its cavernous texture,

* The conical figure which the cornea assumes in this disease, is a characteristic mark by which the *staphyloma* may be distinguished from the *leucoma* with complete opacity of the cornea.

but which, in process of time, has become arid, coriaceous, prominent in consequence of excessive distension from within outwards, and covered by a callous stratum formed by the lamina of the conjunctiva, and its varicose vessels? It is certain, that whenever the inveterate *staphyloma*, projecting beyond the eyelids, happens to become accidentally ulcerated from external violence, from the acrimony of the tears, or from the long continued pressure of the parts upon which it rests, a diminution in its size has never been observable in consequence of such ulceration; on the contrary, it is stated to have happened frequently in such cases, that the exulcerated inveterate *staphyloma* has degenerated into a fungus of a malignant nature.

In the highest degree of this disease, therefore, when the *staphyloma* projects out of the eyelids, the most effectual means of arresting the progress of the disorder, and removing the deformity, which we are at present in possession of, is the excision of the tumor, and when the wound is healed, the application of an artificial eye.

Of this operation Celsus * expresses himself in the following manner. *Curatio duplex est. Altera ad ipsas radices per medium transuere acu duo lina ducente; deinde alterius lini duo capita ex superiore parte, alterius ex inferiore, adstringere inter se, quæ paulatim secando id excidant. Altera in summa parte ejus ad lenticulæ magnitudinem excindere; deinde spodium; aut cadmium infricare. Introlibet autem facto, album ovi lana excipiendum, et imponendum; postea-*

* De Medicin. lib. vii. cap. 7.

quæ vapori aquæ calidæ fovendus oculus, et lenibus medicamentis unguendus est.

Although the first method, or that of deligation, is at present laid aside, as admitted by all to be less convenient; the greater part of surgeons, nevertheless, continue to pierce the base of the *staphyloma* with a needle and thread, not indeed with a view of making a ligature upon the tumor, but to form a loop, by which a commodious hold may be taken, for the purpose of retaining the eyeball firmly at the time when the extirpation is performed. But since this advantage, as I shall hereafter shew, may be obtained by a more simple, expeditious, and less inconvenient method to the patient; I am persuaded that the apparatus of the needle and thread will, ere long, be abandoned, not only as a method of treatment, but as an auxiliary in the operation.

With respect to the second mode of removing the *staphyloma*, or that by excision, it appears to me that sufficient attention has not been paid to what has been delivered by Celsus on this subject. For he does not direct that the *staphyloma* should be divided circularly at its base, as is practised in the present day, but that the excision should be made in the centre or extreme point of the tumor, and that a circular portion of the summit or apex of the *staphyloma*, equal in size to a lentil-seed, should be removed. *In summa parte ejus ad lenticulæ magnitudinem excindere.* The great importance of this precept of Celsus, in the treatment of the *staphyloma*, can only be estimated by those who have had frequent opportunities of comparing the advantages of this mode of operating, with the very serious incon-

veniences which arise from the common practice of removing the *staphyloma* circularly at its base, and the still greater evils which are produced by the circular division of this tumor, including the sclerotica, according to the practice of Woolhouse; as such a mode of treatment is invariably followed by violent inflammation of the eyeball and eyelids, most acute pain in the head, watchfulness, convulsions, copious suppuration, and sometimes gangrene of the eye and eyelids. It is, in my opinion, a certain fact, established on an extensive series of observations, that the further the semicircular excision of the *staphyloma* is made from the centre or apex of the tumor towards its base, and consequently the nearer the sclerotic coat, the more violent are the symptoms consequent on this operation; and *vice versa*.

Consistently with these facts, the following is the method of effecting the destruction of the inveterate *staphyloma*, which I have adopted. The patient being seated, I direct the head to be properly held by an assistant, then with the small knife*, which is used for the extraction of the cataract, I pierce through the *staphyloma* at a line and a half or two lines from the centre or apex of the tumor, in the direction from the external to the internal angle of the eye; and passing the knife precisely in the same direction as in the extraction of the cataract, I divide the apex of the tumor downwards in a semicircular manner. Having done this, I take hold of this segment of the *staphyloma* with the

* Plate III. fig. 7.

forceps, and turning the cutting edge of the scalpel upwards, I finish the operation by removing the apex of the *staphyloma* circularly; so that the detached portion is two, three, and sometimes four lines in diameter, according to the size of the *staphyloma*. And as a portion of the iris is generally included in the section of the apex of the tumor, from this membrane having contracted an adhesion to the cornea at the commencement of the disease, as soon as the circular division of the summit of the *staphyloma* is completed, the crystalline, or its nucleus, is immediately discharged from the eye, and after it a portion of the dissolved vitreous humor. In consequence of this evacuation the eyeball is frequently so much diminished as to admit of being covered by the eyelids, over which I immediately apply a dry compress and bandage.

The pain produced by the incision is trifling, and it is common to see patients very easy during the three or four first days after the operation. On the 4th day, in general, the eye and eyelids begin to be painful, inflamed, and tumefied. On the appearance of these symptoms the eye should be covered with a bread and milk poultice, with a view of promoting and accelerating the suppuration of its internal membrane. Where, indeed, the progress is regular, the swelling of the eyelids subsides towards the seventh and ninth day, and some puriform matter is seen upon the poultice, mixed with the dissolved vitreous humor, which slowly issues from the bottom of the eye; these are succeeded by the matter becoming thicker and whiter, the patient becoming easy, and by a manifest diminution of the

whole eyeball, which not only retires within the eyelids, but deeply within the orbit.

If the eyelids be gently separated at this period, the conjunctiva is found tumid and reddish, and the edge of the divided portion of the *staphyloma* appears as if it were formed by a small circle of white skin. On the separation of this gelatinous circle, which seldom exceeds the twelfth or fourteenth day from the operation, the margin of the wound becomes florid; it then contracts daily more and more, and lastly closes entirely. A small fleshy prominence remains only for a few days in the centre of it, resembling a small reddish papilla, which, by a few applications of the argentum nitratum, retires completely and heals.

The symptoms occasioned by this operation, are so far from being considerable, that in the greater number of cases, the surgeon by paying too rigorous attention to the precept of Celsus in operating on a large *staphyloma*, is obliged to irritate the eye for several days after the operation, in order that it may inflame, partly by leaving it for a long time uncovered and exposed to the air, and partly enlarging the wound made in the centre of the *staphyloma*, by removing another circular portion half a line in breadth, and thus facilitating still further the discharge of the humors, and the admission of the air to the cavity of the eye. The same object is gained by introducing into the eyeball through the circular wound of the cornea a small fold of linen which is removed as soon as a sufficient degree of inflammation and suppuration has been excited in it. When the inflammation has once commenced

in the internal part of the eye, and is succeeded by suppuration, the rest of the treatment proceeds regularly, by the use of emollient applications only, and is speedily completed. And as, by adopting the method of destroying the *staphyloma* here recommended, the consequent contraction of the eyeball takes place equally around the greater axis of this organ, the mutilated part which remains is also regular in its circumference, and offers an easy and convenient support to the artificial eye.

CASE LX.

Regina Fedele, a female peasant, 19 years of age, living in Cassanmagnago, had, from her infancy, a *staphyloma* of the left eye, in consequence of the small pox, which gradually increased, so as to project beyond the eyelids for more than an inch. The deformity, as well as the inconveniences arising from the perpetual weeping, and the frequent attacks of ophthalmia, which, by consent, were also propagated to the sound eye, induced the poor girl to apply to the hospital for relief on the 20th of November 1785.

I ingenuously acknowledge, that experience had not then sufficiently instructed me in the best method of operating in cases of *staphyloma*, and although I was of opinion that the removal of a portion of the sclerotic coat with the tumor ought to be proscribed from practice, yet it appeared to me a matter of little consequence that the incision should be made at the very borders of the cornea with the sclerotic coat. With the knife, therefore,

which is used for the extraction of the cataract, I pierced through the base of the *staphyloma*, at the part where the cornea and sclerotica unite, and divided it downwards; then with the forceps and scissors I removed the whole tumor of the cornea circularly. The eyeball was presently emptied of the humors, and retired within the eyelids. On examining the detached cornea, which had formed the *staphyloma*, attentively, I found that this membrane was entirely distinct from the callous stratum of the conjunctiva covering it; and that it was not thicker than natural, but in some parts even thinner. At the moment the *staphyloma* was extirpated, the patient felt acute pain. After the operation the eyelids were covered with a dry compress and bandage; and as the patient was plethoric I ordered blood to be taken from the arm. Half an hour afterwards she was seized with vomiting and universal shiverings, which returned at intervals during the day and following night, notwithstanding the use of Riverius's mixture and opiate enemata.

The following day the eyelids and ball of the eye appeared unusually tumid, and of a dark red colour, threatening gangrene. The fever was very smart, the pulse hard, with redness of the countenance, and very acute pain in the head. I therefore ordered blood to be taken away from the foot, and at night directed that leeches should be applied upon the left temple, and the eyelids covered with a poultice of bread, milk, and saffron. During the night of the 2d day the patient was deliri-

ous, and was seized at intervals with universal rigors.

On the 3d day, observing that a blackish substance presented itself between the edges of the tumefied eyelids, resembling clotted blood, I carefully separated them, and there gushed out half a table-spoonful of grumous blood mixed with aqueous humor, which was attended with relief to the patient and a diminution of the general symptoms.

On the 6th day, as the excessive tumefaction of the eyelids was a little diminished, I found the eyeball sullied with matter which was diluted and fetid. The edge of the wound was sloughy, and a small abscess the size of a pea was also formed in the conjunctiva, corresponding to the external angle of the eye, which I opened with a lancet. From the bottom of this small abscess arose shortly afterwards a fungus which gave me some uneasiness. I continued, however, the application of the emollient poultices, and the internal use of a grain of the tartarized antimony in a pint of the decoction of the root of the triticum repens, taken in small doses, which kept up the perspiration, and procured one or two motions daily.

It was not till the 13th day after the operation, that the suppuration began to assume a healthy appearance, and the fever and the pain in the head to abate. The eyelids and ball of the eye afterwards subsided gradually, and the fungus of the conjunctiva became stationary.

The healthy suppuration continued copious for a month, during which the margin of the wound

of the *staphyloma* remained dark and sloughy. When the suppuration of the internal part of the eye was greatly diminished, this sloughy margin separated in the form of an eschar, and left a small wound of a healthy aspect. The fungus of the conjunctiva at the external angle of the eye disappeared, and the diminished eyeball retired towards the bottom of the orbit. In three weeks more the small wound in the centre of the remaining part of the eyeball was perfectly healed.

By means of the decoction of the cinchona, and a proper diet, the young woman recovered her former strength, and about ten weeks from the operation, after having suffered the most acute pain, with great hazard of her life, returned home perfectly cured, as far as the nature of the disease admitted.

CASE LXI.

Maria Antonia Bariola, of the valley Salinbeni, 30 years of age, of a delicate complexion, was disfigured from her infancy with a *staphyloma* of the right eye. The tumor had gradually increased, so far as to protrude beyond the eyelids, particularly from the age of four years, after receiving a blow upon that eye. The *staphyloma* frequently inflamed, and produced a corresponding affection of the left eye also, which, on her admission into the hospital, was not only inflamed, but ulcerated upon the cornea.

After some time had been taken up in the treatment of the ulcer and ophthalmia of the left eye;

I proposed to the patient to submit to the excision of the *staphyloma*, which occupied the right eye, lest the left eye, which frequently participated in the inflammation with which the other was affected, should be ultimately lost also. The patient assented to it, and on the 6th of February, 1796, I pierced the most pointed part of the *staphyloma*, with the knife used for the extraction of the cataract, at the distance of a line and a half from the centre or apex of the tumor, forming a semicircular border at the lower part, which being raised with the forceps and turned upwards I removed circularly with the same instrument, taking away a portion of the apex of the tumor of the cornea three lines in diameter. The brown and disorganized lens passed through this aperture, and afterwards a considerable portion of the dissolved vitreous humor. On carefully examining this circular portion of the cornea, separated from the rest of the *staphyloma*, I found it thinner than that membrane is in a sound state, except that some parts of it were thickened by the induration and callosity of the lamina of the conjunctiva, which covered it. The eyeball was a little diminished, and the eyelids being closed, I directed them to be covered with a dry compress and bandage.

The patient did not seem to feel much pain from the operation, nor during the five following days, neither were the eyelids or eyeball at all inflamed. A small quantity of mucilaginous humor only, issued from the eye daily. As the inflammation and suppuration of the internal part of the eye, how-

ever, was necessary to obtain the proposed intention, and seeing that after six days from the excision of the *staphyloma* there was no appearance of its taking place, I ordered the patient to remove the bandage, and expose this eye as freely to the air as the sound one. It was thirty hours after this expedient before the eye and eyelids began to inflame and tumefy, which was attended with moderate pain and slight feverishness. A poultice of bread and milk was now applied, and after three days the suppuration was seen to proceed from the internal part of the eyeball, at first of a serous, but afterwards of a good quality. The margin of the wound was pale and sloughy.

In eight days the suppuration abated, and shortly afterwards, on the separation of this small sloughy circle, the wound contracted so that there was no longer any aperture in its centre, but a small reddish fleshy papilla, which I touched several times with the argentum nitratum. The emollient poultice was now discontinued, and the vitriolic collyrium substituted in its stead, which was dropped into the eye several times a day. The eyeball very much diminished, and flattened at the part previously occupied by the *staphyloma*, preserved its motion, and presented a very good support for the application of the artificial eye. The cure was completed in little more than a month from the period at which the eye began to be inflamed.

In comparing this case with the preceding, the advantage which results from the small circular excision of the apex or summit of the *staphyloma*,

in the manner taught by Celsus, must be obvious, contrasted with the alarming symptoms which succeed the removal of this tumor at the line where the cornea and sclerotica unite, and more particularly if it be executed in the sclerotic coat itself.

I shall not subjoin, as I might do, any other similar cases on this subject, since those which I shall relate at the end of the next chapter, will equally contribute to a fuller confirmation of this practical point.

CHAP. XVIII.

OF THE DROPSY OF THE EYE.

In all the cavities of the animal body, moistened by a serous vapour, as in those destined to contain a certain and determinate quantity of aqueous and limpid fluid, there is such a reciprocity of action between the secerning extremities of the arteries, and the mouths of the *absorbent* vessels, that the fluid poured into these cavities is held in circulation, and incessantly renewed, without ever accumulating beyond a certain degree, or determinate quantity. If this relation of action between these two vascular systems be interrupted or destroyed, in consequence of general or local indisposition, the cavities, no longer lubricated by the serous vapour, contract, and are obliterated; or, on the contrary, become unusually distended by the excessive quantity of serous or watery fluid incessantly collecting and stagnating in them, and acquire an immoderate size and much greater than any one unacquainted with these subjects might imagine.

The eye, considered merely as a cavity destined to contain a certain and determinate quantity of serous, limpid, aqueous fluid, is sometimes subject to one and sometimes to the other of these two diseases, the first of which is denominated *atrophy*,

the latter *dropsy* of the eye.* In the first case, the eyeball gradually diminishes, so as to contract itself and waste away; and as the *absorbent* system never ceases to act, so where there is a defect of fluid to be absorbed, it takes up, by little and little, the solid parts of the eyeball, which it insensibly wastes, and in process of time even destroys. In the second case, the eye becomes of a size greater than natural, and sometimes so extraordinary in its bulk as to protrude out of the eyelids, at first accompanied with great weakness, and afterwards with complete loss of sight.

The generality of surgeons teach, that the immediate cause of the *dropsy* of the eye is sometimes the increase of the vitreous, at other times of the aqueous humor. In all the cases of *dropsy* of the eye which I have operated upon, or have examined in the dead body, in different stages of the disease, I have constantly found the vitreous humor, accordingly as the disease was inveterate or recent, more or less disorganized, and in a state of dissolution; nor have I been able, in any instance, to distinguish, on account of the increased quantity, which of these two humors, vitreous or aqueous, had had the greater share in the formation of the disease. Among the most esteemed modern oculists, there are some who believe that the principal cause of the disease ought to be referred to the contraction of the inorganic pores of the cornea, through which the aqueous humor being no longer able to transude, stagnates within the eye, and there produces the *dropsy*. In asserting this, they appear not sufficiently acquainted with the activity

of the *absorbent* system in the animal economy, nor seem to have considered, that in conformity with their theory, the *dropsy* of the eye ought constantly to succeed the *pannus* of this organ, the *leucoma*, and extensive cicatrices of the cornea, a circumstance which is contradicted by daily observation and experience.

Lastly, I have dissected an eye affected with *dropsy*, in a child about three years and a half old, who died of marasmus. In this eye, the vitreous humor was not only wanting, and the cavity which it occupied filled with water, but the membrane of the vitreous humor was also converted into a substance, partly spongy, and partly *lipomatose*. The eye was a third part larger than the sound one. The sclerotic coat was not thinner than that of the sound eye, but was flaccid and yielding, and when separated from the choroid coat, could not support itself or preserve the globular form. The cornea in its disk was a third part larger than the sound one, had lost its natural pulpy quality, and was sensibly thinner than that of the sound eye. Between the cornea and the iris there was a considerable quantity of aqueous humor of a faint red colour. The crystalline lens, with its opake capsule, was pushed a little into the anterior chamber of the aqueous humor, where it could not advance further in consequence of its capsule having contracted a firm adhesion with the iris around the edge of the pupil. When this capsule was opened, the crystalline passed out, one half of which was dissolved, and the rest very soft. It was impossible to make an entire separation of

the posterior capsule of the crystalline from a hard substance, which appeared to be, as it was in reality, the membrane of the vitreous humor altered in its texture. On dividing the choroid coat from the ligamentum ciliare to the bottom of the eye, a considerable quantity of reddish water issued from the posterior part of the eye, but not a particle of vitreous humor. Instead of vitreous humor there was a small cylindrical substance, partly fungous, partly *lipomatose*, surrounded by a considerable quantity of water, which ran through the longitudinal axis from the entrance of the optic nerve to the corpus ciliare, or to that hard substance to which the posterior convexity of the capsule of the crystalline strongly adhered. This small cylinder, for two lines and a half from the entrance of the optic nerve forwards, was covered by a stratum of whitish substance folded upon itself, as the omentum is, when it is drawn upwards towards the fundus of the stomach. I suppose that this stratum of whitish substance was the remains of the disorganized retina; for on pouring some rectified spirit of wine upon the whole internal surface of the choroid coat, and upon the small cylinder, I found no trace of retina upon it, and this white substance, folded upon itself, acquired a considerable degree of firmness, precisely as the retina does when immersed in spirit of wine. The little cylinder, as well as the hard substance which occupied the place of the corpus ciliare, was evidently the membrane of the vitreous humor, emptied of water, and converted into a mass, partly spongy, as I have said, and partly *lipomatose*. It is not easy to determine whe-

ther this fungous and *lipomatose* degeneration of the membrane of the vitreous humor had preceded the *dropsy* of the eye, or had been the consequence of it. This case, however, added to several others of dropsical eyes which I have examined, in which the posterior part of the eye was found to contain only water or bloody lymph, instead of the vitreous humor, contributes greatly to prove, that the disease consists principally in a morbid secretion of fluid from the small cells of the vitreous humor, and sometimes, also, in a singular degeneration of the alveolar membrane, of which the vitreous humor is composed *.

The increased secretion of aqueous fluid without, as well as within the small cells composing the vitreous humor, with rupture of those cells from excessive distension; and at the same time the diminished energy of the *absorbent* system of the affected eye, are most probably, as they are in all dropsical affections, the causes of the stagnation and morbid accumulation of the humors in this organ. From this stagnation and gradual increase of the vitreous and aqueous humors, it necessarily follows, that the eyeball assumes at first an oval figure, terminating in a point at the cornea; then, by enlarging in all its dimensions, it arrives at a size greater than the other, and ultimately protrudes out of the orbit, so as no longer to admit of being

* In the 21st chap. it will be seen, that in this case, the *dropsy* of the eye was found associated (which does not generally happen) with another more formidable disorder, which is formed at the back part of the eye, to which the term fungus *hæmatodes* has been recently applied.

covered by the eyelids, disfiguring the patient's countenance, as if an ox's eye had been inserted in the place of the natural one.

This disease is sometimes preceded by blows upon the eye or corresponding temple, or by an obstinate *internal* ophthalmia; at other times by no other inconvenience than a troublesome sense of swelling and distension in the orbit, difficulty in moving the eyeball, and considerable diminution of sight: and occasionally it takes place without these or any other causes sufficiently evident; especially if the disease happens in children at a very early age, from whom no account can be obtained. As soon as the eye has assumed the oval figure, and the anterior chamber has become larger than natural, the iris appears placed more backwards than usual, and is in a singular manner tremulous on the slightest motion of the eyeball *. The pupil continues dilated in all degrees of light; and the crystalline is sometimes of a dark colour from the commencement of the disease, at other times it only becomes so in the highest degree of it. When the disease becomes stationary, and the crystalline lens is not deeply opake, the patient can distinguish light from darkness, and, in a small degree, the figures of bodies, and the most vivid colours; but when the eye has increased greatly in bulk, and the crystalline become entirely opake, the retina is,

* BEQUET is mistaken in stating, that I regard the oscillation of the iris as an effect of the dropsy of the eye; I mention this phenomenon only as enumerating it among the several others which accompany this disease, it being very well known, that the tremulous motion of the iris is sometimes met with in eyes in every other respect sound. *See Mémoire sur le tremblement de l'iris.*

as it were, rendered paralytic, by the excessive distension, and consequently is no longer sensible to the few rays of light which pass through the edges of the opake crystalline to reach the bottom of the eye.

In the last stage of the disease, or when the dropsical eyeball protrudes out of the orbit, and can no longer be covered by the eyelids, to the ill effects already enumerated, are added those which arise from the aridity of the eyeball, the contact of extraneous bodies, the friction of the cilia, the discharge of matter and tears, the ulceration of the lower eyelid, upon which the eyeball presses, and the excoriation of the eyeball itself; in consequence of which, the *dropsical* eye is occasionally attacked with violent ophthalmia, attended with severe pain in the affected part, and the whole of the head. Nor does the ulceration always keep within certain bounds, but spreads, first rendering the cornea opake, and afterwards destroying the sclerotica, and, in proportion, the other component parts of the eyeball.

On the first appearance of the *dropsy* of the eye, surgical writers advise the internal administration of mercurials in large doses, so as to produce salivation, as in the treatment of the hydrocephalus internus, the extract of cicuta, that of the pulsatilla nigricans (anemone pratensis); and externally, astringent and corroborant collyria, a seton in the neck, and compression upon the protruding eyeball. As far, however, as I have consulted the result of the observations of the best practitioners upon this subject, I have not met with a single history correctly detailed of a cure of the *dropsy* of

the eye by means of these internal remedies. And, with respect to the external applications, I know from my own experience, that when the disease is manifest, astringent and corroborant collyria, as well as pressure upon the protuberant eye, are highly injurious. In these cases, I have succeeded in quieting, for some time, the uneasy sense of distension within the orbit, and upon the forehead and temple of the same side, of which patients in this state complain so much, particularly when they are affected with recurrent ophthalmia, by means of a seton in the neck, frequent ablutions with the aqua malvæ, and the application of a plaster made of the same plant. But as soon as the eyeball begins to protrude from the orbit, and to pass beyond the eyelids, there is no means of preventing the unhappy consequences of the disease, but by an operation which consists in evacuating the superabundant humors of the eye, by means of an incision, and thereby obliging its membranes, in consequence of a mild inflammation and suppuration of the internal part of the eye, to contract themselves, and retire to the bottom of the orbit. To defer this operation longer, would be to abandon the patient to the inconveniences of an habitual ophthalmia, the danger of ulceration of the eyeball and subjacent eyelid, and even to the carcinoma of the whole eye, with the hazard of his life.

To fulfil this indication of emptying the eyeball of the superabundance of aqueous fluid confined in it, the *paracentesis* of the eyeball was formerly highly commended. Nuck*, one of the advocates for

* De Duct. Ocul. Aquos. page 120.

this operation, punctured the eye by means of a small trocar, precisely in the centre of the cornea. Afterwards it was judged more proper to puncture the eyeball through the sclerotic coat, at about two lines from its union with the cornea, for the purpose of more easily evacuating the vitreous humor also, together with the aqueous, in such quantity as might be thought sufficient to diminish the morbid enlargement of the eyeball.

This method of operating in the *dropsy* of the eye, notwithstanding the approbation it received from the most celebrated surgeons, is at present fallen into disuse, as ineffectual and inadequate to the purpose. Nor will this appear surprising to those who are acquainted with our present notions upon the animal œconomy, particularly with respect to the *absorbent* system, and who are not unaware how little can be reckoned upon the favourable success of the *paracentesis*, as a mode of treatment in chronic *dropsies* in general, but particularly that of the tunica vaginalis, or *hydrocele*. For the radical cure of the latter is never obtained, unless, after the water is evacuated, the *adhesive* inflammation takes place in the tunica *vaginalis* and *albuginea*, or when both these membranes suppurate, ulcerate, and contract a firm adhesion to each other, by which the possibility is taken away of any further collections of water in the scrotum. And if it has occasionally happened that the puncture has effected a radical cure of the *hydrocele*, it is because by an unforeseen accident it has excited an inflammation of the tunica *vaginalis* and *albuginea*, and has thereby produced a coalescence of these two membranes.

According to these principles, the *paracentesis* of the eye, directed only to evacuate the superabundant quantity of fluid contained in it, can never be a means of curing the *dropsy* of this organ, unless the puncture made by the trocar excite an inflammation and suppuration, and afterwards a coalescence between the membranes composing it. NUCK relates, that, in a young man of Breda, on whom he performed the operation, he was obliged to puncture the eye five times at different periods; that at the sixth time it was necessary to employ suction through the canula, in order to evacuate as great a quantity of vitreous humor as possible; and lastly, that he was under the necessity of introducing a plate of lead between the palpebræ and eye, for the purpose of maintaining a continual pressure upon the empty and diminished eyeball. In a woman of the Hague, he says, that he punctured the eye twice without advantage, and that she was two or three times more subjected to the same operation, without, however, adding what was the result of it. I have not much difficulty in believing, that the radical cure of the *dropsy* of the eye may have been sometimes obtained by means of the puncture, after repeated introductions of the trocar, and other similar harsh modes of treatment with the canula of this instrument, introduced into the eyeball; but this success cannot be attributed to the simple evacuation of the superabundant quantity of vitreous and aqueous humor; but to the irritation produced by the canula, and to the consequent *adhesive* inflammation or the suppuration excited in the internal membranes of the eye. It is not surprising that

Woolhouse, after having learnt this from experience, wishing to secure the perfect success of the *paracentesis*, for the radical cure of the *dropsy* of the eye, should afterwards have taught that when the canula has been introduced into the eye, it ought to be rotated between the fingers at least six times; and, according to the same rule, Platner should have proposed, that after the humors of the eye have been discharged by means of the trocar, a tepid fluid should be injected into the eye through the canula; and Mauchart, that the aperture made in the eye should be kept open by means of a small tent of lint *. If all these circumstances prove on the one hand the insufficiency of the paracentesis in the radical treatment of the *dropsy* of the eye, they evidently shew on the other, that the perfect cure of this disease can only be obtained by emptying the eye of its humors, and at the same time exciting in its internal membranes a certain degree of inflammation and suppuration.

In order to obtain this completely, the most easy and expeditious method hitherto proposed, is, without doubt, that which I have detailed in the preceding chapter on the radical treatment of the inveterate staphyloma, which projects beyond the eyelids. Upon which I cannot but repeat also upon the present occasion, that the circular excision of the dropsical eyeball in the sclerotic coat is highly disadvantageous, if not dangerous. For this opera-

* [illegible]ajani, after a second puncture has become necessary, advises the introduction of a small plug, and afterwards the dilatation of the aperture with the probe-pointed scissors, so as to be able to introduce freely into the cavity of the eye a small fold of lint. *Collezione di Osserv.* t. i. *Osserv.* 34.

tion is constantly followed by the most alarming symptoms, as repeated hæmorrhages, collections of grumous blood in the back part of the eyeball, violent inflammation of the eyeball, of the eyelids, and head; incessant vomiting, convulsions, and delirium, with great hazard of the patient's life. Those modern writers, indeed, who have faithfully communicated to the public the result of their practice upon this subject, in the number of whom, after LOUIS*, MARCHAN †, and TERRAS ‡, deserve much praise, have ingenuously declared that in some cases of *dropsy* of the eye, in which they have performed this operation, they have had much reason to regret their attempt §.

The circular incision made in the upper part or centre of the cornea of the dropsical eye, of the circumference of a large lentil-seed, or rather more, in the manner described by Celsus on the subject of *staphyloma*, is exempt from these very unpleasant consequences. By means of this operation, which is in no degree painful, an opening is made for the discharge of the humors, and an inflammation is promoted in the internal parts of the eye. And

* Mémoires de l'Acad. de Chirurg. t. xiii. page 286. 290.

† Journal de Med. Paris. Janvier 1770. Sur deux exopthalmies ou grosseurs contre nature du globe de l'œil.

‡ Ibidem Mars 1776. Sur l'hydrophthalmie.

§ I have no doubt that it will be the same with any one who may be induced to try the method proposed by Mr. FORD for the radical cure of this disease; of passing a seton formed of six threads of white silk from one canthus of the eyeball to the other, and withdrawing them one after another in the course of a month, in the manner employed by POTT for the cure of hydrocele. See *Medical Communications*, Vol. 1. page 409.

this is obtained without occasioning such a sudden evacuation and subsidence of the membranes of the eye, as necessarily happens when the circular incision is made in the sclerotic coat, which greatly affects the nerves of this organ, and the parts sympathising with it, as the head and stomach; this intimate consent not being perhaps the least of the causes from which the unhappy consequences before mentioned are produced; independently of those which necessarily arise from the almost sudden exposure of a large surface of the bottom of the eye to the contact of the air, and the frequent use of lotions which are employed in these cases.

With respect to the method of operating, it is precisely the same as that detailed in the preceding chapter. The surgeon, therefore, whether the cornea be transparent or not (since, as I have said, the action of the immediate organ of vision, in these cases, is irremediably lost) should pierce this membrane with the small knife, at the distance of a line and a half from its summit or centre, and passing the instrument from one canthus of the eye to the other, should divide it downwards in the form of a semicircle; then having raised this segment of it with the forceps, and turned the cutting edge of the knife upwards, he should complete the operation by removing a circular portion of the centre of the cornea, of the size of a large lentil-seed, or of three lines in diameter in the case of an adult. Through this circular opening in the centre of the cornea, the surgeon, by a gentle pressure, should force out as much of the superabundant humors of the eye, as may be sufficient to allow the diminished eyeball

to re-enter the orbit, and be covered by the eyelids. For the remainder, which is left stagnating in the eye, will gradually flow out through this circular aperture in the centre of the cornea, without the assistance of further pressure.

Until the appearance of the inflammation on the 3d or 5th day from the operation, the eye should be covered by a dry compress and bandage. But as soon as the eye and eyelids begin to be inflamed and swollen, the surgeon should, if necessary, employ internal remedies suited to moderate the inflammation, and should cover the eyelids with a poultice of bread and milk, which ought to be renewed every two hours at furthest. It very frequently happens, both in the case of *staphyloma* and in the *dropsy* of the eye, that on the first appearance of the inflammation, the eye which has been operated on increases in size, and protrudes out of the eyelids again nearly as much as before the operation. In this case it will be useful to cover the projecting portion of the eyeball with a small piece of fine linen spread with a liniment composed of oil and wax, or with the yolk of an egg and the oil of St. John's wort, and to apply the poultice of bread and milk over it.

When the suppuration of the internal part of the eye has commenced, which will be evident by the dressings being moistened with a tenacious lymph mixed with a portion of the humors of the eye which will incessantly flow from the opening in the cornea, and by the margin of the incision assuming a pale sloughy appearance, the eyelids will subside, the eyeball diminish in size and gradually re-enter the orbit, and continue to contract itself more

and more. The little circle of slough upon the edge of the wound in the cornea will afterwards separate in the form of an eschar, and leave a small ulcer of a healthy colour, which in the same manner as the eyeball will gradually contract till it is closed and entirely healed, leaving sufficient room between the eyelids, and the mutilated portion of the eyeball, for the apposition of an artificial eye.

Although the circular excision of the centre of the cornea of the size of a large lentil-seed, be sufficient in the adult to excite a mild inflammation and suppuration in the internal part of the eye; yet if this should not manifest itself before the 5th day, it will be necessary to expose the eye to the air, or as I have said, in speaking of the *staphyloma*, to remove, by means of the forceps and curved scissors, a circular portion of the cornea of a line or rather more in breadth; which occasions the patient no inconvenience or pain, and produces the desired effect of ultimately exciting an inflammation and mild suppuration of the internal part of the eye, without which a complete cure cannot be obtained.

CASE LXII.

A peasant boy, 13 years of age, of a healthy and robust constitution, had no other complaint, except an immoderate enlargement of the right eye, which projected so much out of the orbit that the eyelids were not sufficient to cover it. The cornea, although not clear, allowed the deeply-seated iris to be yet seen through it, the pupil dilated, and the crystalline of a dark colour.

His mother informed me that at two years of age, a little after the desiccation of the small-pox, he was afflicted with a violent inflammation in both his eyes with a thick speck, particularly on the right; that by means of repeated blisters to the neck and behind the ears, and other external and internal remedies, he finally recovered the use of his left eye; but that the right remained in the same state; and that it afterwards enlarged gradually till it acquired the enormous size which it had when I saw him; without his having ever complained of violent pain in it.

The boy being taken into the hospital, I agreed to perform the operation upon him, which was on the 8th of June 1797.

Having pierced through the middle part of the cornea with the small knife which is used for the extraction of the cataract, and elevated the lower segment of it with the forceps, I removed a circular portion of the centre of it with Daviel's scissors, rather more than two lines in diameter; and as the crystalline did not advance by a slight pressure, I opened its capsule with the point of the knife, from which a milky humor immediately escaped, and afterwards the dark coloured nucleus of the crystalline, and by a moderate degree of pressure, a considerable quantity of vitreous humor in a state of dissolution, by which the eyeball was so much diminished, that on directing the patient to close his eyelids, they were sufficient to cover it completely.

The boy did not seem to feel much pain during the operation, and passed the first and second day

out of bed, without experiencing any inconvenience.

On removing the compress and bandage from time to time, they were moistened with a glutinous humor, which had all the appearance of being the dissolved vitreous humor. On the fourth day I found the eyelids swollen, red, painful, and a little separated, and the eyeball inflamed, with moderate pain in the head, and slight fever. I ordered a poultice of bread and milk to be applied upon them, and to be renewed every two hours.

On the seventh day the suppuration commenced in the internal part of the eyeball, at first of a serous, and afterwards of a mucous and good quality, with a diminution of the fever and pain. The suppuration continued in larger or smaller quantity for two weeks, and in the mean time the palpebræ and eyeball subsided greatly, and the latter very much diminished in size, retired towards the bottom of the orbit. The small sloughy circle which surrounded the incision in the centre of the cornea, separated entirely, and left a small wound of a florid colour, which in a week closed, and by a few applications of the argentum nitratum healed entirely. The deficiency of the eye might have been easily supplied by an artificial one.

CASE LXIII.

A young lady, 16 years of age, of a delicate constitution, in other respects healthy and regular, was affected with an enlargement of the left eye, which increased in all its dimensions, so as in the course

of nine years to become twice the size of the opposite one, and projected out of the orbit, not admiting of being covered by the eyelids.

Her parents attributed the disease to a fall which she had when a child upon a heap of wood and rubbish, by which the eye was struck and violently bruised, and greatly discoloured externally. The cornea on this side was, to some extent, become opake; but the pupil, notwithstanding, could be seen beyond it irregularly dilated, and the crystalline dark.

While the eyeball remained on a level with the orbit, the patient complained of no greater inconvenience than that of blindness, but as soon as it ceased to be covered by the eyelids an ophthalmia supervened, which became habitual, and was occasionally communicated to the sound eye; and this was accompanied with a very troublesome sense of tension in the enlarged eye, and in the temple of the same side. Astringent applications, compression, and the internal use of the pulsatilla nigricans, had, as far as it appeared, augmented the pain in the head and eye, and had rendered the attacks of ophthalmia more frequent than before.

On being consulted, I proposed to empty the dropsical eye by the excision of a portion of the cornea, as the only expedient capable of arresting the progress of the disease, and preserving the sound eye. The patient, as well as her friends, rejected this project as too violent and extreme. In order to allay the pain in the eye and head, and the troublesome sense of tension in the orbit, I prescribed to the patient the application of small bags of mallows with a little camphire, and the emulsion of gum

arabac with a few drops of the tincture of opium to be taken at night.

Two months after the consultation, the same inconveniences returned with so much violence, that the patient demanded to have the operation instantly performed; which was executed precisely as in the preceding case, that is, by removing a circular portion in the centre of the cornea, of the size of a large lentil-seed. Some aqueous, and a large quantity of thin vitreous humor flowed out, and also the dark crystalline in a state of dissolution. The eyeball retired a little within the orbit, so as to be covered by the eyelids.

The patient found great relief from this evacuation of the eye, and continued perfectly easy till the fifth day. Finding, however, that the eye was slow in inflaming, I directed the patient to keep it exposed to the air the whole of the sixth day. On the night of the seventh the eyelids were tumefied, and the eyeball began to inflame, and gradually to enlarge to such a degree as to be ready to project out of the eyelids again. The fever, however, and the pain in the eye and head, were moderate. The eyelids and eye were covered with a cloth spread with the yolk of an egg and oil of St. John's wort; and over it was applied a poultice of bread and milk. The general treatment was limited to some emollient clysters and a low diet.

On the eleventh day the serous suppuration took place, and afterwards the mucous, which continued abundant for twenty days longer, on the appearance of which, the fever and pain in the eye entirely abated, and the tumefaction of the palpebræ

and eyeball gradually subsided. The small sloughy circle around the incision in the cornea was afterwards detached as usual; the little ulcer of a good colour contracted, forming in the centre a kind of fleshy papilla, which was repressed by the argentum nitratum, and finally healed entirely. The young lady, though cured, could not bear the application of the artificial eye, till eight months after the evacuation of the eyeball.

CASE LXIV.

In the beginning of June, 1799, Signor Vincenzo Visconti, a very able apothecary of this city, came to me with his infant son, about a year and a half old, who had been just brought to him from the country, where he had been nursed, that I might examine the left eye, which had become considerably more turgid and prominent than the right, with tumefaction of the eyelids of that side, and a species of sugillation of the conjunctiva, particularly towards the internal angle. The father conjectured that it had arisen from a fall or blow upon the left eye; but the nurse strongly denied it. The child did not seem to be in pain, and appeared as if he could see with this eye. I ordered the little patient to be gently purged, and resolvent fomentations to be applied externally.

These remedies were of no advantage, and the eyeball increased in size with such rapidity, that by the middle of November of the same year, it projected out of the orbit prodigiously, and was so large as not to admit of being covered by the eye-

lids; which, as well as the conjunctiva, were occasionally inflamed, without any evident cause, on which account it was sometimes necessary to take away blood locally, by means of leeches. At this period the sight of the left eye was greatly diminished, if not entirely lost.

The rapid enlargement of the eyeball, the inutility of the remedies hitherto employed, the deformity of the countenance, and more particularly the danger of the sound eye being affected by it, or the *dropsy* degenerating into a much worse disease, determined me, together with Signor VOLPI, surgeon of this hospital, to empty and diminish the size of the dropsical eye.

On the 21st of November, therefore, the child being placed upon a table, and held by proper assistants, with the small knife, which is used for the extraction of the cataract, I pierced through the cornea of the dropsical eye, near the centre of it, and taking hold of the divided semicircular border with the forceps, and turning the cutting edge of the knife upwards, I removed a circular portion of the centre of the cornea, of the diameter of a small lentil-seed. I chose, in this case, to remove as little of the centre of the cornea as possible, not only as I was desirous of ascertaining again, whether the symptoms consequent on the evacuation of the eyeball, are in proportion to the extent of the circular incision made in the cornea, but because I greatly feared, that in so young a child, a sudden and violent inflammation of the eye and eyelids might be attended with fatal consequences.

Through this small aperture formed in the cen-

tre of the cornea, the semi-fluid and dissolved crystalline escaped, and a large quantity of thin vitreous humor; so that the eyeball instantly retired within the eyelids, which were covered with a compress and bandage. The child slept a little after the operation, and afterwards got up and passed the rest of the day as usual, in play, without shewing any sign of pain.

From the 21st to the 28th, some fluid, resembling the dissolved vitreous humor, flowed from the eye, and the eyeball and palpebræ subsided daily; but no appearance of inflammation presenting itself in the internal part of the eye, I ordered the child's eye to be uncovered, with the precise view of causing it to inflame; which, however, had no effect.

On the 30th of November, I observed that a portion of the vitreous humor, not dissolved, but firm and globular, protruded out of the circular aperture formed in the centre of the cornea, and the eyeball appeared less diminished than it was on the preceding days. With a stroke of the scissors I removed this obstacle formed by the vitreous humor, and on pressing upon the eyeball gently, a considerable quantity of bloody serum flowed out, after which the eyeball became as small as on the preceding days.

On the 2d of December some signs of inflammation in the eyelids and conjunctiva appeared. The child seemed desirous to lie in bed. I ordered a bread and milk poultice to be applied upon the tumid eyelids.

On the 8th of December, the inflammation of the eyelids and conjunctiva, instead of extending,

as I had hoped, within the eyeball, and, on the contrary, entirely ceased, and a portion of the iris presented itself at the small opening made in the centre of the cornea, which completely closed up this aperture, and the eyeball, in the mean time, became again turgid. I pushed back this procidentia of the iris with the point of a probe, and immediately a remarkable quantity of bloody serosity flowed out.

Convinced now, that the circular aperture formed in the centre of the cornea was two small, and less than was requisite for exciting an inflammation of the internal membranes of the eye; by means of the forceps and curved scissors, I removed a circular portion from the border of the cornea, so as to render this opening of a circumference equal to a large lentil-seed. After this an inflammation was speedily excited in the internal parts of the eyeball, which had a very mild course, never obliging the child to lie in bed, nor causing it any acute pain. The internal inflammation having terminated in suppuration, true pus began to appear upon the poultice: from this time the cure proceeded with the greaest regularity to the end, without the child's ordinary mode of living, or its usual good humor, being interrupted.

In proportion as the discharge of matter proceeding from the internal part of the eye diminished in quantity, the eyelids subsided, and the eye diminished in size, and sunk towards the bottom of the orbit, leaving at last a regular surface, which would serve at pleasure for the convenient support of an artificial eye.

The result of this history proves, in the most convincing manner, what has been asserted in the two last chapters; that the violence of the symptoms consequent on the operation of the *staphyloma* and *dropsy of the eye*, are in proportion to the extent of the circular incision made in the eyeball, for the evacuation of the humors. That, therefore, the very useful precept of CELSUS, of removing only a circular portion of the centre of the cornea, of the size of a lentil-seed, admits of some exceptions. For if this incision be too small to allow the humors to be readily discharged, and the blood which afterwards collects within the eyeball, or be such as to be easily closed up by some portion of the vitreous humor, which is not dissolved, by a portion of the iris, or by grumous blood, it gives occasion to new collections of bloody serosity within the cavity of the dropsical eye, and prevents the inflammation and suppuration of its internal membranes; a circumstance absolutely necessary to obtain the end which the surgeon proposes in the treatment of this disease.

CHAP. XIX.

OF THE ENCYSTED TUMOR WHICH IS FORMED IN THE CAVITY OF THE ORBIT OF THE EYE.

A SOFT tumor contained in a membranous capsule is sometimes formed in the cellular adipose substance which surrounds and insinuates itself between the muscles of the eye, and the other parts contained in the orbit, similar in every respect to the *encysted* tumors, which are generated in the other cellular parts of the body. In the greater number of cases, the tumor is as large as a pigeon's egg, and sometimes even larger. In general it contains a compact fatty substance; occasionally it is divided internally into two compartments, in one of which is found a mixture of a liquid and a cretaceous substance, and in the other a glutinous fluid resembling the white of egg; and in some cases the tumor is wholly filled with a limpid or sanious fluid.

The origin or root of the *encysted* tumor is generally seated below the eyeball more or less deeply in the cavity of the orbit; but it very rarely arises from the bottom of this cavity, and enlarges so as to press the eyeball beyond the orbit and palpebræ without its becoming perceptible. Most frequently, as I have stated, it originates below the globe of the eye, or a little to the side of it, and as it increases in volume, it projects from the orbit against the

lower eyelid, so as to elevate it in the form of tumor, and press it downwards upon the cheek sometimes to the extent of half an inch.

During its enlargement, the tumor of necessity has a constant tendency to force the eyeball out of its natural situation; and as its origin is below the inferior hemisphere of the eyeball, this organ is gradually pushed upwards towards the superior eyelid and out of the orbit: so that, finally, the pupil of the displaced eye no longer corresponds, either in its position or direction, to that of the sound side. But if the *encysted* tumor, increasing from beneath the eye, incline more towards the nose than the temple, the eye is forced outwards and forwards towards the external angle of the palpebræ, and *vice versa.* In this unnatural position of the eyeball, notwithstanding its immobility, and the great distension under such circumstances to which the optic nerve is subjected, the power of sight in the displaced eye is not in all instances of this kind entirely abolished.

The deformity arising from this disease is frightful; and it is easy, from the circumstances enumerated, to foresee, how various and unpleasant must be the consequences attendant on it, as double vision, the continual discharge of tears upon the cheek, frequent pain in the eye and head, repeated ophthalmia, and the painful impression of light.

There is undoubtedly no other really efficacious means of remedying this disease than the extirpation of the *encysted* tumor from the cavity of the orbit, which, being effected, it is not afterwards difficult,

as experience has proved, to restore the eyeball to its natural situation.

This operation is executed in the following manner. The patient being placed horizontally, with his head a little raised, and firmly held by an assistant, the surgeon, with the fore and middle fingers of one hand, should draw the skin of the eyelid tense upon the tumor, and with a convex-edged bistoury divide the skin of the eyelid and orbicular muscle transversely in the direction of the fibres of that muscle and the lower arch of the orbit. This incision ought to be made with the hand unsupported, in order that the cyst of the tumor may not be included in it; and should also extend a little towards the two angles of the eye, according to the size of the tumor, in order to render the other steps of the operation within the orbit easy and expeditious; observing carefully in making this incision to avoid the lachrymal duct at the internal angle. On the protrusion of the cyst from the wound, the surgeon should separate it carefully from the lips of the wound, and to as great a depth as possible within the orbit, and then introduce on one side of it a fine hook with a single or double point, by which, having gained a secure hold of the body of the tumor, he may draw it gently towards him. In this position, with the point of the bistoury, or with the points of scissors adapted to it, he should separate it around from all its other adhesions within the orbit, as well as from its principal and deeper attachments to this cavity. It will rarely happen that, in separating the upper part of the cyst from the lower eyelid, the portion of conjunctiva, which

unites the eyelid to the lower hemisphere of the eye-ball, will be injured; as, in the course of the disease, this expansion of the conjunctiva, following the protrusion of the eyeball and palpebræ out of the orbit, is, as it were, everted, and consequently sufficiently removed from the summit of the subjacent *encysted* tumor, to prevent its being included in the dissection of it, and the separation of the surrounding parts. On dividing the deeper roots of the tumor, it is sometimes found that they are, contrary to all expectation, hard and coriaceous; on this account, after the removal of the tumor, it is proper to introduce the point of the finger gently to the bottom of the cavity from which it has been removed, in order to ascertain whether any portions of this hard substance remain; in which case it will be necessary to remove them by means of the small hook and point of the scissors. If the cyst, on being first laid hold of by the hook, should accidently burst, and the whole of the serous, albuminous, or puriform fluid contained in it should be in consequence discharged from it, since, as I before stated, the tumor sometimes contains only a fluid inclosed in one or more membranous compartments, it is not necessary on this account to relinquish the principal object of the operation, or that of removing the whole cyst; which may be accomplished in the manner just now laid down, although, indeed, with greater difficulty than when the tumor is firm and admits of being drawn out by degrees from the margin of the orbit.

The hæmorrhage is never considerable after this operation; the first dressing, therefore, consists

only in gently filling the cavity, from which the tumor has been removed, with lint. The inevitable consequences of the operation are, very great pain in the orbit and head, inflammation of the eyelids, and sometimes of the face and neck; for the removal of which symptoms, recourse must be had to bleeding, according to the patient's strength, antiphlogistic purgatives, emollient and anodyne topics, and low diet. If, on the fifth day from the operation, suppuration has commenced, the dressing is to be removed. In some cases it is necessary to do this sooner; when, for instance, there are certain indications that the intensity and continuance of the pain in the orbit and head arise from grumous blood collected in the cavity, before occupied by the tumor, although filled with lint; on giving a discharge to which the pain ceases.

As soon as the general and local symptoms are quieted, a healthy suppuration and granulation commences at the bottom of the wound, and the cavity containing the tumor gradually diminishes, and finally heals. During the treatment, the surgeon should be careful to keep the external lips of the wound in the eyelid separated, by the introduction of a folded dosil, in order to give a free issue to the matter discharged from the orbit, and to prevent the edges of the wound from uniting before the cavity, situated in the soft parts of the orbit in which the tumor was lodged, has closed. The cure is effected in general in four or five weeks.

The eyeball, notwithstanding the removal of the extraneous body by which it had been forced out of its natural position, does not return so soon to

its proper situation as might perhaps be imagined by those who are unacquainted with the subject. The long continued retraction of the elevator muscle of the eyeball, and the elongation of the depressor, when the globe of the eye is pressed upwards and outwards by the tumor, or, in a similar manner, the shortening of the abductor and relaxation of the adductor muscle, when the eye has been forced out of the socket towards the temple, are the principal and obvious causes by which the complete cure of the disease is retarded. Immediately after the operation, indeed, when the eyeball is gently pressed on in the direction contrary to that in which it was forced out of its place, it is easily restored to its situation; but on the pressure being removed, it returns to its former vitiated position. As soon, therefore, as the general and local symptoms, arising from the operation, have abated, and the eyeball on being pressed back can be contained and covered by the eyelids, it will be proper, by pressure upon it, to direct it towards its natural situation, and carefully maintain it there, by means of graduated compresses and a suitable bandage. We have some examples in which, even without this aid, after a very considerable time, however, the muscles of the eye have spontaneously recovered their tone and reciprocity of action; but it is undoubtedly a great advantage, confirmed by practice, to be able to obtain it more promptly and without much inconvenience to the patient, and not to leave the work entirely to nature. HOPE, in this case, made use of a small machine, apparently resembling a *tourniquet*, placed upon the tem-

ple of the affected side, with a concave plate to press upon the eyelids and ball of the eye, lined with a soft cushion. By means of a screw, he pushed the eyeball back, and maintained it in its situation, and the author affirms, that in the course of twenty days he had obtained the desired intent. Notwithstanding all this, as it has been found by experience, that the same beneficial effects may be obtained by compresses and a bandage, this method, on account of its simplicity, must, I believe, as far as regards the success, be always preferable to any the most ingenious machine.

It sometimes happens, after the extirpation of a very large tumor of this kind, that when the part is healed, a fungous substance arises from the conjunctiva uniting the eyelid to the lower hemisphere of the ball of the eye, by which these parts are kept separated from each other. This soft fungous substance, when it happens to be formed, is the effect of the great distension made on the eyelid, and especially the conjunctiva and its vessels, which have become flaccid in consequence of the excessive protrusion of the eyeball. If some means be not promptly applied to remedy this occurrence, the *ectropion* is inevitable. When the disorder is not very considerable, this may be done by means of astringent collyria containing alum; but if it should appear to resist these applications, it will be necessary to have recourse to the excision of the fungus of the conjunctiva, as has been proposed and described for the cure of the *ectropion*. The relaxation of the upper eyelid, as far as I know, is never so great, in conse-

quence of this disease, as not to yield to the assiduous use of spirituous and astringent applications. When the globe of the eye has regained its natural position, the optic nerve also recovers entirely, or, in a great measure, the degree of vitality and action which it had lost during the distension made upon it; consequently after the operation, and the eye has been restored to its situation, the patient's power of seeing is improved, or at least some perception of light returns even where this faculty appeared to be entirely extinct.

It has been already noticed, that the formation and enlargement of the *encysted* tumor within the orbit is very rarely strictly confined to the bottom of this cavity, so as to force the eyeball directly out of the orbit and eyelids, without some certain indication being afforded of its presence as the principal cause of such disorder. But the history of surgery furnishes us on this point with a fact minutely detailed and deserving attention, related by Mr. Spry *, which, for the convenience of students, I shall here briefly transcribe.

A young woman complained of feeling a constant pain in the left eye and temple, with some defect of sight; the patient imagined her eye to be larger than the sound one, which was not really so, nor was there any redness of the conjunctiva; the cornea only had lost a little of its transparency, and the pupil was more dilated than in a state of health; bleeding, purges with calomel, blisters, a

* Philos. Transact. Vol. XLIX. an. 1755.

seton in the neck, collyria of various kinds, and afterwards the division of the temporal artery, afforded the patient no relief. Some months after the pain increased, the conjunctiva was inflamed, and the cornea became more opake. The pains now increased beyond measure, to which some relief was afforded by scarifying the vessels of the conjunctiva. After ten months, the upper eyelid was so distended, and the tumor increased to such a size, as to project beyond the eyelids. The disease was considered as a *carcinoma* of the eye, which nothing but the complete extirpation of this organ could remedy, which was performed without further delay.

When the knife had penetrated to a small depth, a considerable quantity of a sanious fluid gushed out with great force, and the tumor subsided. The surgeon nevertheless proceeded in the extirpation of the eye, and found a large membranous cyst, which filled the whole of the orbit behind the eye. This unexpected circumstance made no change in the plan of operating. The fungous eye was extirpated, together with the greater part of the cyst, the remainder of which was left at the bottom of the orbit, and sloughed away. The cure was completed in a month; after which the woman enjoyed the most perfect health, without there being any appearance of a return of the disease.

The extirpated eye was found rather larger than the sound one. The aqueous humor turbid; the crystalline less solid and transparent than natural; and the vitreous humor reduced to a liquid state. The cyst, which was also examined at the same time,

was of a compact elastic texture, and large enough to contain a hen's egg*.

In some very rare instances, the eye has been found to be forced out of the orbit by a *cystic* tumor totally different from that now described; that is, by a pulsating tumor, possessing the characters of aneurism. This disease has been described for the first time, as far as I know, by Mr. TRAVERS†.

The subject of this alarming disease was a woman. The pulsating tumor was apparently divided into two unequal parts. The upper and smaller part occupied the internal canthus of the orbit; it was soft and yielding, and gave to the touch a vibrating sensation, or thrill; and when firmly compressed, a deep pulsation was perceptible in it. The veins of the upper eyelid, and on the side of the nose, were varicose. The skin covering the lachrymal sac appeared raised; the inferior and larger portion of the tumor was conical, tense, and elastic to the feel; when pressed upon, it could be made to recede within the orbit, but the pulsation was then increased, and the eyeball, being pressed on by the retroceding tumor against the osseous parietes of the orbit, produced insupportable pain. No good effect was produced on it by pressure on the temporal, angular, or external maxillary arteries. On the contrary, when the carotid of that side was compressed, the pulsation in the tumor in a great measure ceased. Every to-

* See on this subject Saint-Yves, cap. 21; Hope. Philos. Transac. an. 1744; Bromfield. Med. Observ. and Enquiries, Vol. IV.; Barnes. Medico-Chirurg. Transact. Vol. IV.

† Medico-Chirurg. Transac. Vol. II. p. 1.

pical remedy, including the application of cold, being found useless, and considering that the tying the carotid artery, if it should not completely cure the disease, would at least contribute much to retard its progress, it was agreed to try the operation. Shortly after the ligature was made on the carotid, the patient said, that she suffered less than before, and that the noise in her head had ceased. The upper and smaller part of the tumor gave yet an obscure thrilling sensation. The vibration or thrilling was perceptible on the third day; and was also felt in the lower and larger tumor when firmly compressed. On the fifth day the tumor was diminished, and the eye was less prominent than before. At the end of the fifth week, these advantages were more remarkable, and she expressed herself free from the acute pain which had so long distracted her. Five months after the operation, the patient, who was in the tenth week of pregnancy, miscarried, and the hæmorrhage in consequence of it was so considerable, as to induce syncope and extreme debility. On the following morning, it was found that the tumor was remarkably diminished, and the pulsation had entirely ceased, and that the eye was also less prominent than on the preceding days. The state of general debility continued for a long time, in consequence also of discharges of blood from the bowels.

Two years after these vicissitudes, the only vestige remaining of the disease was a small knob of the size of a large pea, over the inner canthus of the orbit.

Mr. HODGSON* says, that he examined this woman five years after the operation, and that he found no mark of the disease left in the orbit. On this subject, he very properly remarks, that in such cases it would be useful to assist the process of the cure by depletion and a rigorous diet; as the fact before stated has demonstrated, that the rapid diminution of the tumor, and the total cessation of pulsation in it, took place immediately after the violent evacuations of blood from the uterus and intestines. For, in general, in the treatment of aneurism, in proportion as the impetus of the arterial blood is diminished against the aneurismal *sac*, the more speedily is the plug of coagulum formed in it, which prevents the further increase of the tumor, to which if absorption succeed, the total disappearance of it is finally accomplished. But this measure becomes more particularly useful in the case now related, as the branches of the carotid artery, when tied, preserve nevertheless a free and prompt communication with those of the other carotid, and with the vertebral, in consequence of which, particularly in vigorous subjects, the reflux and repercussion of the arterial blood within the aneurismal sac is very strong.

Another case similar to this, occurring in a pregnant woman, is related by Mr. DALRYMPLE†. The aneurism was formed suddenly during the night in the left orbit, succeeded by severe pain during pregnancy, and a remarkable increase of the tumor after

* Treatise on the Diseases of the Arteries and Veins, p. 446.
† Medico-Chirurg. Trans. Vol. VI.

parturition. The eyeball forced out of the socket, and the sight of it lost, had caused an eversion of the eyelids. The cutaneous veins of the face were turgid, and the patient was tormented with pain in the head, and a continual noise like the rippling of water. The symptoms, as well as the pulsation of the tumor in the orbit, ceased, on compressing the left carotid artery. Mr. DALRYMPLE tied the artery, and obtained a perfect cure of the disease in the space of 103 days. All the phænomena dependent on the aneurism, except the blindness, vanished.

CHAP. XX.

OF THE AMAUROSIS AND OF THE HEMERALOPIA.

The celebrated surgeons SCHMUKER and RICHTER, guided by observation and experience, have treated this subject with so much precision and clearness, that it only remains for me at present to add some reflections and facts, which tend to confirm the truth and utility of the doctrine of these two illustrious writers, and thus facilitate the studies of the young surgeon.

The *amaurosis* is *perfect or imperfect, inveterate or recent, continual or periodical.* The *perfect inveterate amaurosis*, with organic injury of the substance constituting the immediate organ of vision, is a disease absolutely incurable. The *imperfect recent amaurosis*, particularly that which is *periodical*, generally admits of a cure, since it is most frequently connected with a disordered state of the stomach and primæ viæ, or is dependent on causes, which, though they affect the immediate organ of vision, may be removed without leaving any trace of disorganization, either in the optic nerve or retina.

In general, those cases of *amaurosis* may be regarded as incurable, which have existed for several

years, in persons advanced in age, and whose sight has been weak from their youth; those which have been slowly formed, at first with a morbid increase of sensibility in the retina, and afterwards with a gradual diminution of perception in this organ to complete blindness; those in which the pupil is immoveable, without being much, or rather being little dilated, or where it has lost its circular figure, or is so much dilated as to appear as if the iris were wanting, having also an unequal or fringe-like margin; in which the bottom of the eye, independently of the opacity of the crystalline lens, has an unusual paleness, similar to horn, sometimes inclining to green, reflected from the retina, as if from a mirror*; which are accompanied with pain of the whole head, and with a constant or an intermitting sense of painful tension in the eyeball; which have been preceded by great and protracted incitement of the whole nervous system, and afterwards by general debility and languor of the whole constitution, and especially of the digestive organs, as in hypochondriacs, or after the long abuse of spirituous liquors, manustupration, or premature venery; those which have been preceded or accompanied by attacks of epilepsy, or by frequent and

* The retina of a sound eye is transparent, and, therefore, in any degree of dilatation of the pupil, the bottom of the eye is of a deep black colour. This unusual pallor, then, which accompanies the *amaurosis*, indicates, that a considerable change has taken place in the substance of the optic nerve forming the retina, which, according to all appearance, is become thickened, and rendered permanently incapable of transmitting the impressions of light. This sign, therefore, is one of the most unfavourable.

violent hemicrania, which have come on in consequence of violent and obstinate *internal ophthalmia*, at first with an increased, but afterwards diminished sensibility of the retina, and slowness of motion in the pupil; which, besides being inveterate, are the consequence of blows upon the head; which have been occasioned by direct blows upon the eyeball*; which have appeared after violent contusion and laceration of the *supraorbital* nerve†, whether this has taken place immediately after the blow, or some weeks after the healing of the wound of the supercilium; which have been occasioned by extraneous bodies penetrating the eyeball, as leaden shot‡, &c.; those which are derived from the confirmed lues venerea, in which the presence of one or more exostoses upon the forehead, upon the sides of the nose, or upon the maxillary bone, lead to the suspicion, that there may be also similar exostoses within the orbit: those which are derived from obstinate cephalalgia, with a slow accumulation of serum in the ventricles of the brain, or induration of the thalami nervorum opticorum; lastly, those which are conjoined with a manifest change of figure and dimension of the whole eyeball, as when it is of a long

* This arises less in my opinion from the form and size of the contunding body, than from the force and velocity with which it has been propelled, and the resistance of the sclerotica, which, not yielding so easily as the other membranes of the eye, transmits the vibrations which it has received in full force to the retina.

† Of the numerous cases of *amaurosis* of this kind, I do not know that any one has been cured, except that related by VALSALVA, in his Dissert. II. § XI.

‡ Nessi, Instituzioni di Chirurgia, t. III. page 282.

oval figure, or of a preternatural bulk or smallness. Maitre-Jan certainly alluded to these causes of amaurosis, when he said, *c'est rechercher la pierre philosophale que de vouloir chercher des remedes pour guérir le goute sereine; cette maladie est absolument incurable.*

On the contrary, those cases of *recent imperfect amaurosis*, most frequently at least, if not always, admit of a cure, which, although the patient be almost, or even completely deprived of sight, have not been produced by any of those causes which are capable of contusing, or destroying, the organic texture of the optic nerve or retina; in which the immediate organ of vision preserves some, though little, sensibility to the light, whether in the direction of the axis of vision, or laterally; those cases of sudden and recent *amaurosis*, in which, although the pupil is preternaturally dilated, it is not excessively so, and is regular in its circumference; behind which the bottom of the eye is of a deep black colour, as in a natural state; which have not been preceded or accompanied by violent and continual pain in the head and eyebrow, nor by a sense of constriction in the eyeball; which have originated from violent anger, excessive grief or terror; those which have succeeded an excessive fulness and crudity of the stomach, plethora either general or confined to the head, the suppression of accustomed sanguineous discharges from the nose, uterus, or hæmorrhoids; those occasioned by an evident metastasis of variolous, rheumatic, herpetic, or gouty matter; which are the consequence of profuse loss of blood; which are to be referred to a nervous

debility, not inveterate, in persons who are young, and which is consequently yet susceptible of being remedied; those produced by convulsions and violent efforts during a laborious parturition; those which accompany the course or decline of acute or intermittent fevers; and those, lastly, which are *periodical*, or which come on and disappear at intervals, every day, every three days, every month, or at a certain season of the year.

By an attentive examination of the nature and causes of the *imperfect amaurosis* which admits of a cure, it is found, from the careful observations of Schmucker and Richter, that this disease is most frequently derived from a morbid excitement or irritation in the digestive organs from sordes, or from worms especially in children, either alone, or accompanied with general nervous debility, in which the eyes participate sympathetically. Agreeably to these principles, in the greater number of cases of *recent imperfect amaurosis*, the principal indication of cure which the surgeon ought to fulfil in the treatment of this disease, is that of unloading the stomach and primæ viæ of the crudities, worms, or morbific stimuli; and afterwards of strengthening the gastric system, facilitating the digestion, and at the same time exciting the whole nervous system, and particularly that of the eyes, which are affected and rendered torpid by a sympathetic connection.

From a want of clear demonstrations, respecting the manner in which, during a healthy state, certain reciprocal actions, by the intervention of nerves, take place between distant organs; and cer-

tain affections in a diseased state are propagated from one part to another, the term *sympathy* was substituted. It is not the less true, however, that these *sympathies* do exist, especially between the stomach and head, the knowledge of which serves as a very useful guide to the physician. For we see, under the action of certain poisonous substances, applied to the internal membrane of the stomach, vertigo, diminution of sight, and even blindness arise, which effects disappear as soon as this stimulus has been removed from the stomach. Nor can it be regarded as an improbable thing, that stimuli may be generated in the stomach capable of producing the same effects upon the eyes, as experience furnishes us with proofs of it.

With respect to the first part of the treatment of the *imperfect amaurosis*, the intention is perfectly answered by emetics and internal resolvents (*antiphlogistic purgatives*). In the class of emetics, experience has taught, that the *antimonium tartarizatum* is preferable to every other, and that when given afterwards in small and divided doses, it answers the purpose of a resolvent medicine, the action of which may be increased by conjoining it with gummy or saponaceous substances. In the treatment of the *imperfect amaurosis*, therefore, which is most frequently sympathetic, and depending on acrid matters in the primæ viæ, it will be proper at first, in the greater number of cases, to dissolve for an adult, 3 grains of tartarized antimony in 4 ounces of water, of which 2 table spoonsful may be taken every half hour, until it produces nausea, and afterwards abundant vomiting. On the following day he should be ordered to take the

resolvent powders, composed of 1 ounce of the crystals of tartar and 1 grain of the tartarized antimony, divided into six equal parts, of which the patient should take one in the morning, another four hours afterwards, and the third in the evening, during eight or ten successive days. This medicine will produce a slight nausea, and some evacuations of the bowels more than usual, and perhaps, after some days, even vomiting. But if, during the use of this opening powder, the patient make ineffectual efforts to vomit, and complain of a bitter taste and want of appetite, without any amendment of the sight, the emetic should be repeated, and even a third and fourth time, if the presence of the morbific stimuli in the stomach, bitter taste, tension of the hypochondria, acid eructations, and tendency to vomit, require it. For it not unfrequently happens, that the patient, on the first action of the remedy, throws up only water with a little mucus, but on repeating the emetic, after the nauseating powder has been used for some days, a considerable quantity of yellowish green matter will be thrown up, which will greatly relieve the stomach, head, and eyes.

In children, where the disease is evidently occasioned by worms in the stomach and primæ viæ, which is inferred from the pallid, sallow, and bloated countenance, turgescence of the abdomen, constant pain or torpor of the head, nausea, fœtid breath, constant pruritus in the nostrils and fauces, disturbed sleep, interrupted by spasmodic motions of the muscles of the face and eyes, extraordinary dilatation of the pupil, and lastly, from the discharge of worms, the use of anthelmintics is not

less indicated than useful in the treatment of this species of *amaurosis*. Among the remedies of this sort, that which in my opinion merits the preference, is the *coralline of Corsica*, provided it is genuine, which it is not easy to find in the shops. In defect of this remedy, I am in the habit of substituting the powder of the *semen santonici*, but in larger quantities than are commonly prescribed. The dose of the *coralline* for a child of six years old, is a dram and a half, which should be infused for a night in six ounces of water, and on the following morning the whole boiled down to a sixth part, adding to it, when strained, a spoonful of sugar. As a substitute for this medicine, the *semen santonici* is employed in doses of half an ounce, with the addition of a quantity of honey sufficient to form it into an electuary. Both these remedies should be taken in the morning, fasting, and repeated for some days, until worms are no longer discharged with the fœces, after which the *imperfect amaurosis* proceeding from this cause, disappears, especially in children, with wonderful rapidity.

Returning now to the cure of the imperfect amaurosis in adults, depending on weakness and loading of the stomach. The stomach being cleared, the opening pills of SCHMUKER*, or those of RICH-

* R. Gum. Sagapen.
Galban.
Sap. venet. an. drachmam j.
Rhei opt. drachmam unam et semis.
Antim. tartariz. grana xvj.
Suc. liquirit. drachmam unam. F. Pilul. gran. unius.
The patient should take 15 of these pills, morning and evening, for the space of 4 or even 6 weeks.

TER*, should be prescribed. The phænomena which are usually observed to happen in consequence of this treatment, are the following: the patient, after having vomited copiously, feels more easy and comfortable than before. Sometimes on the same day on which he has taken the emetic he begins to distinguish the surrounding objects; at other times this advantage is not obtained till the 5th, the 7th, or 10th day; and in some cases not till some weeks after the adhibition of the emetic, and the uninterrupted use of the opening powders, or pills. As soon as the patient begins to recover his sight, the pupil is found less dilated than before, and also contracts more when exposed to the vivid light of a candle; and in proportion as the power of vision augments, this contraction and mobility of the pupil increases. Upon the whole, the cure is seldom completed in less than a month, during which time the use of local remedies calculated to excite the torpid action of the nerves of the eye should not be neglected, as will be hereafter mentioned.

When the surgeon shall have sufficient reason to believe, that by means of these remedies the

* R. Gum. Ammoniac.
Ass. fœtid.
Sap. venet.
Rad. Valerian. sylv.
Summit. arnicæ an. drachmas duas.
Antim. tartariz. gran. xviij. F. pilulæ granorum duorum.

The patient should take 15 of these pills 3 times a day for some weeks.

offending matters which stimulated the stomach have been completely eliminated, and especially after the patient has, in a great measure, regained his sight, the plan of treatment should be directed to strengthen the stomach, and invigorate the nervous system in general, and that of the nerves of the eye in particular. A powder should therefore be prescribed, composed of one ounce of the cinchona and half an ounce of valerian root, divided into six equal parts; of which the convalescent should take one morning and night, in any convenient vehicle, and continue the use of this medicine for at least five weeks. In the mean time he should live on tender juicy food and weak broths, should take a moderate quantity of wine, and use gentle exercise in a salubrious air.

As a local application, both during the continuance and decline of the *imperfect amaurosis*, in order to rouse the languid action of the nerves of the eye, the vapour of the aqua ammoniæ puræ properly applied to the affected eye is of the highest advantage. This remedy is made use of by placing a small vessel containing it near the patient's eye; so that the highly penetrating vapour with which it is surrounded may excite a pricking sensation in that organ; by the action of which, in less than half an hour, the eye which is exposed to it, becomes red and waters copiously. It is then proper to desist from it, and repeat it three or four hours afterwards, and continue it in this manner until the *amaurosis* is perfectly cured. If both the eyes are affected with the dis-

ease, it is unnecessary to observe that it is requisite to make use of two small vessels filled with the aqua ammoniæ puræ, or if one only be employed, that it will be necessary to hold it first to one eye and then to the other, until both water abundantly, and become red. It is necessary to renew the aqua ammoniæ puræ every third day, in order to preserve its activity. This very useful application ought to be employed from the commencement of the treatment of the *imperfect amaurosis*, or at least immediately after the patient's stomach has been unloaded of the offending matters, by means of an emetic, and should be continued for a length of time, even after the amaurosis is dissipated. THELEN*, besides many others, assures us, that he has also used this local remedy in such cases with advantage. The action of the vapour of the caustic volatile alkali applied to the eyes affected with incomplete *amaurosis*, may be also assisted by other external stimuli applied to parts of the body which have a close consent with them, as blisters to the neck, friction upon the eyebrow with the anodyne liquor, and irritation of the nerves of the internal nostrils by means of sternutatory powders, as that composed of two grains of the hydrargyrus vitriolatus, and a scruple of the powder of the leaves of betony; and lastly, the electric fluid. Electricity has been proposed as one of the principal means of curing the *amaurosis*, but experience has shewn that no confidence

* Medicinische und chirurgische Bemerkungen § *Amaurosis*.

is to be placed [illegible] further than as a secondary remedy; and Mr. Hey*, one of the most zealous promoters of this practice, confesses, that electricity is only useful in cases of recent *amaurosis*, and most frequently only when combined with appropriate internal remedies, among which purgatives are the principal.

With respect to the *imperfect periodical amaurosis*, any one might probably be disposed to believe that the cinchona would be the specific; experience, however, has proved the contrary, and convinced us that however efficacious this excellent remedy may be in intermittent fevers and other periodical diseases, it rather aggravates this disorder, and renders its attacks more frequent, and of longer duration than before. The disease, on the contrary, is most frequently cured in a short time, by emetics, afterwards by internal resolvents, and lastly, by corroborants, and the cinchona which before was useless or injurious.

This plan of treatment in the *imperfect amaurosis* of recent date, is, in the greater number of cases, employed with success, since the disease, as it has been remarked before, is only sympathetic, and principally dependent upon the morbid state of the digestive organs. There are, however, as I have also observed, cases of *imperfect amaurosis*, to the formation of which, besides the more common causes enumerated, others concur, which require the employment of particular methods of treatment, besides those which I have mentioned. Such is, for instance, the *imperfect amaurosis*, which

* Medical Observations and Enquiries, Vol. V. page 26.

takes place suddenly, in consequence of excessive heat, insolation, violent anger in plethoric persons, which demands, before every other measure, the general and partial abstraction of blood, cold fomentations to the eyes, and the whole head; afterwards an emetic, or the purges with the kali tartarizatum, or antimonium tartarizatum, in small doses. SCHMUKER relates, that he had frequently, by means of bleeding and an emetic, recovered soldiers who had lost their sight by making forced marches, when heavily laden, in very hot weather. But an emetic, after the evacuation of blood, is the more indicated in the *amaurosis* suddenly produced by violent anger, as in all these cases the patient complains at the same time of a bitter taste, of tension of the hypochondria, and continual nausea. RICHTER mentions a priest, who being violently enraged, became instantly blind, and to whom having given an emetic the next day, on account of his having evident symptoms of bilious saburræ, he recovered his sight the same day.

So likewise, in the treatment of the *imperfect amaurosis*, arising from a recent and sudden suppression of the catamenia, the principal indication previously to the use of an emetic, is evidently that of reproducing the discharge of blood from the uterus, by means of leeches applied to the internal surface of the labia pudendi, and by pediluvia; and afterwards that of a vomit, of the opening pills before mentioned, of those of BEKKER, or those composed of a grain of aloes and two of myrrh and saffron. If these should not succeed in reproducing the menstrual flux, much confidence may be placed

an electric shocks passed from the loins through the pelvis in all directions, and from that part to the thighs and feet repeatedly, and without abandoning the hope of success, although the good effects of this treatment should not be evident for some weeks, since I am persuaded from experience, that it is one of the most powerful means which we possess, both of reproducing and accelerating the discharge of blood from the uterus.

In the treatment of the *imperfect amaurosis* also, occasioned by the suppression of an habitual profuse hæmorrhoidal flux, and accompanied with tension of the hypochondria, congestion of blood in the head and eyes, difficult respiration and crudities of the stomach, previously to the use of an emetic, the most efficacious method of treating the blindness is that of the application of leeches and warm fomentations to the hæmorrhoidal veins, in order to obtain a copious discharge of blood from them. An emetic will, however, be necessary, and the opening pills of SCHMUKER, or instead of them, those composed of aloes.

So in the treatment of the *imperfect amaurosis*, recently produced by the variolous, rheumatic, herpetic, or gouty metastasis, or from the impetigo of the head imprudently repelled, the surgeon's attention should be directed to eliminate the acrid matters stimulating the stomach, and at the same time determine the peccant humor from the eyes to some other part, by means of a consensual irritation excited in the neck by blisters or setons, or blisters to the arms, hands, or feet; and in the case of impetigo of the head, or of herpetic erup-

tions imprudently repelled, [illegible] the stomach has been unloaded of the sabu[illegible] will be very useful to give HUXHAM's antimonial wine, with the extract of aconite, the extract of [illegible] with calomel, and the golden sulphur [illegible] antimon. præcip.) of the third precipitation, in divided doses, the kermes mi[illegible]ction of the woods, and the warm [illegible]

The method of curing the [illegible] in consequence of fevers which hav[illegible] that derived from deep grief, fe[illegible]or-rhage, profound meditation, or force[illegible] intense exercise of the eyes upon very minute or bright objects, differs very little, if at all, from that which has been already delivered; and consists principally in removing the sordes of the stomach, and afterwards in strengthening the nervous system in general, and particularly that of the eyes.

Indeed, in the consensual *imperfect amaurosis*, in consequence of fevers not rightly distinguished, the practitioner's attention is immediately called to the morbid state of the organs of digestion; as in this disease, besides the blindness or great diminution of sight, the countenance appears pale and tumid, the digestion is slow, the appetite wanting or depraved, there is a bitter taste in the mouth, vertigo of the head, disturbed sleep, and a turgid abdomen with flatulence. In this combination of circumstances, nothing [illegible]tes more to the restitution of the patient's sight than the use of an emetic, and the resolvent pills; afterwards the cinchona, bitters, preparations of steel *, and

* See Haller. Opusc. Pathol. Obs. 76.

externally, [illegible]ur of the aqua ammoniæ puræ.

Deep grief and terror have a direct action, as it were, at the same time, upon the nerves of the eyes and the organs of digestion, the function of which latter is so perverted by these affections, that bilious acr[illegible]dily accumulate in them, from the [illegible] the nervous system in gene-r[illegible]y that of the eyes, is consen-s[illegible]nd, I might almost say, rendered te[illegible]erefore, an emetic be indicated in any recent case of *imperfect amaurosis*, as one of the principal means of dissipating incomplete blindness, it is certainly in that where the disease is derived from grief or terror; the good effects of which have been repeatedly confirmed by experience. In these cases also, after the stomach and intestines are unloaded of the bilious acrid matters, by means of the tartarized antimony, or resolvent pills, the treatment is completed by the cinchona, conjoined with valerian root; and by fumigations of the aqua ammoniæ puræ; by nourishing and easily digestible food; by diverting the mind and directing it to agreeable objects; and by moderate exercise of the body. It has been observed only, that the *imperfect amaurosis*, occasioned by fear, demands the continuance of these remedies for a much longer time than that produced by grief.

The *incomplete amaurosis*, which arises from general nervous debility, in consequence of profuse hæmorrhage, convulsions from *inanition*, or long-continued application to deep studies, especially

by candle-light, is less in reality an *amaurotic* affection than a weakness of sight, from exhausted energy of the nerves, particularly of those which constitute the immediate organ of vision. This inconvenience is cured or diminished, if recent and in young persons, by small and divided doses of the tincture of rhubarb, in order to cleanse the stomach and primæ viæ; afterwards by corroborant and cardiac remedies, and by the patient desisting from whatever debilitates the nervous system, and consequently the sight. Lastly, when the stomach is cleared of the saburræ, the decoction of cinchona with valerian may be prescribed with advantage, the infusion of quassia, with the addition of a few drops of vitriolic æther in each dose, nutritious animal food of easy digestion, and viper broth. The aromatic spirituous vapour mentioned in the chapter on ophthalmia, may be usefully employed as a local application, and if this should not succeed, much advantage may be derived from that of the aqua ammoniæ puræ. The patient should take exercise on foot, horseback, or in a carriage, in a pure and dry air, and in warm weather he should use sea-bathing. He should avoid as much as possible mental anxiety, and should not fix his eyes on very minute or lucid objects*. In proportion as he takes nourishment and regains strength, and the

* It occasionally happens, that patients, in these cases, cannot look at a very near object, with one or both the eyes, without experiencing fatigue and pain in one or in both of them, while they feel no inconvenience from viewing an object at a certain distance. And when the difficulty which they find in looking at a near object is confined to one eye, it is accompanied with strabismus and double sight. This depends upon a debilitated state of

action of the nervous system in general is invigorated, his sight will gradually amend; to preserve and improve which, he should keep in mind, above all, to maintain the tone and vigour of the stomach, and to moderate the vivid impression of light upon the eyes, which he may easily do by never exposing himself to it, unless when they are defended by plain green glasses.

The *hemeralopia* or *nocturnal blindness* is, strictly speaking, only an *imperfect periodical amaurosis*, most frequently sympathetic of disorder of the stomach, the attacks of which supervene towards the evening, and disappear in the morning. This disease is in some countries endemical, and in others epidemical at certain seasons of the year.

Those who are affected with this disease, see objects at sun-set, as if covered with a greyish veil, which by little and little is converted into a dense cloud, interposed between them and the surrounding objects. The pupil, both during the day and the night, is more dilated and less moveable than it is usually in a state of health. In the greater number of cases, however, the pupil is more or less

the muscles of the eyes, in consequence of which the patient is unable to accommodate them properly to very near objects, or maintain them for a length of time in this position; and when the debility is confined to the muscles of one eye, this being unable to concur in the actions of the other, strabismus and double vision are the necessary consequences. This inconvenience is also remedied by the general and local corroborants before mentioned, and by avoiding the strained action of the muscles of the eyes. And if the debility be confined to one eye only, and occasion the strabismus, it will be advantageous to keep the affected eye covered for some time.

moveable in the day, and always enlarged and immoveable during the night. If the patient be placed in a room faintly lighted by a candle, where other persons can see sufficiently well, the objects are either discerned with difficulty, or cannot be seen at all, or he can only distinguish light from darkness; much less is he able to distinguish any thing by moonlight. On the approach of morning he recovers his sight, which remains perfect during the whole day, until sun-set.

The disease is generally cured, and frequently also in a short time, by treating it in the same manner as the *imperfect amaurosis;* by emetics, the opening powders or pills, and by blisters to the neck; and locally, by the vapour of the caustic volatile alkali; and lastly, by the cinchona conjoined with the valerian root. In cases where the disease has been preceded by plethora or suppressed perspiration, bleeding and sudorifics are also indicated.

By this method of treatment, I have succeeded in curing three patients attacked with it. The first was a boy 14 years of age, who, for several weeks, had used fumigations of boiled sheep's liver without advantage. The second was a waterman, and the third a husbandman of our neighbouring rice-fields; each of them between 30 and 40 years of age, were meagre, and had a sallow, tumid countenance. The boy having vomited copiously, after taking a grain and a half of tartarized antimony, dissolved in four ounces of water, in small quantities in the space of two hours, made use of the opening powders during the fol-

lowing days; which occasioned some nausea, and two or sometimes three copious motions every day. On the fifth day at night, he began to distinguish the surrounding objects by the very weak light of a lantern. The vapour of the caustic volatile alkali was used constantly from the first day after the emetic, and on the sixteenth day he was perfectly cured. The waterman, after three doses, vomited a large quantity of yellowish viscid matter. He afterwards used the opening powders, which, on the third day, produced a second vomiting, and exposed his eyes regularly every four hours in the day to the action of the vapour of the caustic volatile alkali. He did not begin till the eleventh day to distinguish objects at night by the weak light of a candle. The husbandman vomited only once in large quantity, but was afterwards greatly nauseated by the opening powders for nine successive days, and had every day a copious evacuation from the bowels of greenish matter; he used also the vapour of the caustic volatile alkali, as a local application, and on the fourteenth day, at night, began to see by the light of a candle, and continued to acquire a greater power of discerning objects at night, until he was perfectly well. Towards the end of the treatment, I ordered this patient to take the cinchona with valerian root.

But the most speedy recovery that I have known, was in the spring of the present year, in the case of Mauro Bonini, of Donelasco, a robust farmer, 22 years of age. In the month of March, he began to discover, that at sun-set he could only distinguish objects very imperfectly. This indisposition

increased to such a degree, that in the beginning of May, he became, towards night, almost entirely blind. On the 10th of May he came to the hospital. On examining him in the day-time, I found the pupil of both eyes unusually dilated, and almost immoveable; and towards night I made the experiment, and satisfied myself that he was blind. The patient complained of a bitter taste, heaviness of the head, and his tongue was furred. On the 11th of May I prescribed an emetic, which did not produce all the effect that I expected; on the following day, therefore, I gave him one more powerful, composed of ℈jss of ipecacuanha, and gr. ij of tartarized antimony. This caused him to vomit a large quantity of yellowish green matter; the patient immediately afterwards found his head relieved, and the bitter taste removed; the pupil of both eyes was a little contracted, and appeared to be in a slight degree sensible to the impression of a vivid light. He began to use the vapour of the caustic volatile alkali externally. On the evening of the same day, the patient's sight appeared to be improved. On the 13th no remedy was employed, except the vapour. On the 14th the patient complained again of a bitter taste, and his tongue appeared furred. I ordered him to take the opening powders every three hours, which produced nausea and repeated evacuations from the bowels. The use of the vapour was continued. Towards the evening he distinguished very well all the objects which were presented to him. On the 16th the symptoms of indigestion entirely disappeared, and the pupil of both eyes was contracted, as in a state

of health. On the 17th the patient left the hospital perfectly cured.

The ancients have very highly commended, in the treatment of this disease, fumigations of sheep's liver roasted, conducted to the eyes by means of a funnel, as well as the eating of the liver thus prepared. This remedy, even at the present time, is generally accredited, not only on the assertions of the vulgar, but also of professional persons; and some writers add, that it succeeds in a surprising manner among the Chinese, where this disease is said to be very frequent. I cannot confirm this by any observation of my own; in the boy before-mentioned, it appeared to me to be of no advantage. If, however, the efficacy of this remedy is a matter of fact, we may boast of having another means of curing the *nocturnal blindness* *, besides that which I have delivered.

* It was an old soldier who imparted to his comrades the remedy which I am about to describe, when there was so large a number affected with nocturnal blindness at Strasburg in 1762. The soldiers cook a slice of ox's liver, weighing about half a pound, in an earthen pot newly varnished, and just large enough to hold four pints of water. When the liver is drest, so as to be fit to eat, and the vapour is of a supportable heat, they place the pot upon the bed, and inclining the head very near it, they throw over a covering so as entirely to enclose them. They remain there until the liver ceases to produce any vapour, or the difficulty of breathing obliges the patient to come out. One application only, is, in general, sufficient for a radical cure. I have known obstinate soldiers who have been unwilling to do any thing for three weeks; and I have sometimes even permitted it, in order to ascertain whether the remedy was as efficacious in an inveterate as a recent affection. I have found no difference, and as I now believe, I have

Celsus *, in the chapter on the Mydriasis, adds the following words. *Quidam sine ulla manifesta causâ subito obcaecati sunt. Ex quibus nonnulli cum aliquandiu nihil vidissent, repentina profusione alvi lumen receperunt. Quo minus alienum videtur et recenti re, et interposito tempore, medicamentis quoque moliri dejectiones, quae omnem noxiam materiam per inferiora depellant.* This passage of Celsus refers, in my opinion, not only to the treatment of the dilated pupil, but also to that of the *imperfect amaurosis*, which takes place suddenly; and appears to me to merit the attention of practitioners.

The first of these observations made by Celsus, that persons affected with *amaurosis* for some time, have recovered their sight on the supervention of a diarrhœa, appears to be confirmed by a case related by Dr. Pye †, of a man 40 years old, who had been afflicted for two months with a *periodical amaurosis*, which, for a certain length of time, attacked him regularly every evening, afterwards irregularly and at different intervals, with great dilatation of the pupil, and such obscurity of vision towards night

made every necessary trial to convince myself, I oblige them to submit to this treatment whenever I am aware of it. I shall not subjoin the names of those who have been cured in this manner. There are at present in the regiment more than 250 men who have been treated in this manner, and even more than 60 at the end of March, and the beginning of last April, 1787.

Dupont, *Mémoire sur la goutte sereine nocturne épidémique, ou nyctalopie.*

* De Medicin. lib. vi. cap. 37.

† Med. Observ. and Enquiries, Vol. I. a[illegible]

that [illegible] not even distinguish the light of a [illegible]. The man was seized with a diarrhœa. Dr. Pye ordered him the saline mixture, which he took for nine days; and afterwards an electuary, composed of the cinchona, nux moschata, and syr. e cort. aurant. These two articles were added to the cinchona on account of the diarrhœa, which still continued. On the second day of using this electuary, the diarrhœa increased, and the patient vomited copiously; after which he recovered his sight almost instantly, so as to distinguish objects as well in the night as in the day. The diarrhœa continued, and after having employed the electuary for two days, it was necessary to suspend the use of it. The diarrhœa was accompanied with a very violent fever, and it was remarked, that in the acme of the fever, although the patient became extremely deaf, he did not lose his sight either day or night. Dr. Pye does not state what means were employed for moderating the fever, but only that it proved fatal. The fact, however, is certain, that this spontaneous evacuation of the bowels had entirely relieved the patient of the *periodical imperfect amaurosis*. I have no doubt, that if an attentive examination were made of the numerous cases recorded in medicine, a great number of similar facts might be met with, proving the influence which offensive substances, stimulating the stomach, have upon the organ of vision, and consequently of how much advantage the spontaneous evacuations of the bowels may be in the cure of this disease.

But, however rare or little noticed may be the

examples of *incomplete amaurosis* disappearing, in consequence of spontaneous vomiting or copious dejections, promoted merely by the powers of nature; we are now in possession of so many cases of the successful treatment of this disease, by means of such evacuations procured artificially with emetics and internal resolvents, that no doubt can be longer entertained of the justness of the second part of Celsus's observation, relative to their propriety in this disease, *et recenti re, et interposito tempore, medicamentis quoque moliri dejectiones, quæ omnem noxiam materiam per inferiora depellant.* The accurate cases related by SCHMUKER and RICHTER, afford numerous certain and satisfactory proofs of this; but the confidence which we must place in the method of treating the *imperfect* and the *periodical amaurosis* now delivered is increased, if we reflect that the most authentic of the ancient writers, in the greater number of instances, have also cured this disease by no other means than those of emetics and purgatives, although in their writings they have attributed the success of the treatment to other causes, or to the efficacy of other remedies which they prescribed in conjunction with them. GALEN*, ÆTIUS†, ÆGI-

* Lib. de oculis, part iv. cap. 11, 22.

† Sermo Septimus, cap. 48. 52. cap. 46. de *hemeralopia.* Si vero per hæc non successerit, rursus purgatorium dandum est, quale est hoc. Scammoniæ obol. iij, castorei obol. ij, salis obol. iij. In debilioribus autem scammoniæ obol. ij, injice. Talis autem purgatio sæpe et vestigio liberavit, aut multo meliorem conditionem induxit. Post paucos dies dandum est purgatorium pituitam et bilem ducens.

NETA*, ACTUARIUS†, RHAZES‡, AVICENNA§, in speaking of the treatment of this disease, recommended bleeding, the use of emetics, when the patient is fasting, or the evacuation of the bowels by purgatives or clysters, and sternutatories. This practice was followed by all the physicians who succeeded them, and was the same at the time of FORESTUS|| and TIMEUS¶. HILDANUS**, who attributed much efficacy in the treatment of this disease to a seton made in the neck, states, however, that he had only employed this method after the repeated use of cathartics. The same thing is met with in the works of SMETIUS††, PLATERUS‡‡, ADOLPHUS§§, and TREW||||.

ST. YVES¶¶, one of the most distinguished oculists of his time, mentions an ecclesiastic, who, a

* Lib. iii. cap. 48.

† De method. med. lib. iv. cap. 11. post sanguinis missionem sternutationes movendæ sunt, et ante cibum vomitibus utendum.

‡ De ægritud. ocul. cap. 4. Cum prolongatur status morbi, provocentur sternutationes, et vomitus jejuno stomacho; deinde curetur cum collyriis valentibus ad hoc.

§ Lib. iii. fen. 3. tractat. 4. Quandoque hoc fit propter communitatem stomachi et cerebri. . . . . . Quod si fuerit ab humiditate, administrantibus tunc illud quod resolvit post evacuationes. Vomitus autem qui fit cum facilitate, est ex iis, quæ conferunt.

|| Obs. et Cur. Med. lib. xi. obs. 32. schol. obs. 38.

¶ Casus medicinal. lib. i. cas. 24.

** Centur. 1. observ. 24. Centur. 5. obs. 13.

†† Miscellan. Med. page 546.

‡‡ Praxis. Med. page 104.

§§ Act. n. c. Vol. ii. obs. 87.

|||| Commerc. Noremberg. T. 7. an. 1737. N. 1.

¶¶ Traité des Maladies des Yeux, chap. 27, 28.

few days after he had lost his sight, having given him an emetic, and opened the jugular vein, recovered his sight; which was afterwards strengthened by means of the vapour of the spirit of wine, properly directed to the eyes. He also states, that he restored the sight of a young canon by the repeated use of purges, weak broths, and the application of spirituous vapours; and expressly states, that he had frequently succeeded in curing the *amaurosis* whenever he had undertaken the treatment of it, immediately on its accession, by taking away blood, and ordering an emetic to be taken once or twice in the interval of two days.

Heister* imagines that he had cured an *amaurosis* by means of salivation only. From the narration which he gives, however, it appears, that previously to the patient's using mercury, he ordered him an hydragogue purgative; and that the following day, on his complaining of nausea and inclination to vomit, an emetic composed of two grains of tartarized antimony and a scruple of sugar, by means of which he vomited copiously, and his nausea was relieved; that after all this he ordered him some pills made with calomel and the extract of fumaria, and the size of a bean of mercurial ointment to be rubbed into the parotid glands; and that on the 9th day, the salivation having scarcely commenced, the patient could distinguish light from darkness. Now from this account, and from comparing it with what we know at present, of the efficacy of emetics and

* System of Surgery, T. I.

purgatives in the cure of this disease, it is easy to infer, that the cure of the *imperfect amaurosis* obtained by Heister is not to be attributed to the mercurial salivation, but to the removal of the offensive matters stimulating the stomach.

The same writer* also, in the case of a woman affected with *amaurosis*, and threatened with complete blindness, from excessive grief, and from having fixed her eyes too long on lucid objects, obtained a cure by means of a single bleeding, and some cathartic pills composed of calomel and jalap. He† likewise restored a servant, whose sight had gradually diminished without any apparent disease in the eye, but who complained of continual nausea, by prescribing for him a powder composed of 25 grains of ipecacuanha, and ten grains of vitriolated kali, to be taken in the morning; and an infusion of euphrasia, hyssop, and sassafras during the day, a blister to the neck, and a stimulant resolutive collyrium.

Ribe‡ mentions a young man, 22 years of age, who had lost his sight three months before he was examined by him, which was restored by the use of an emetic repeated seven times at different intervals.

Helvig§ and Schroëk‖ have transmitted to us several histories of the *imperfect amaurosis*, sympathetic of the stomach and *primæ viæ*, cured by antiphlogistic purgatives only.

* Med. Chirurg. u. Anat. Wahrnehm. 1. Band.

† Loc. cit. Band. 75.

‡ Act. Svecic. Vol. I. Trim. 1. N. 1.

§ Observ. physic. med. obs. 33.

‖ Miscellan. nat. cur. decad. 2. an. 5. obs. 247.

VANDERMONDE* relates the history of a girl, eight years old, who, from saburræ and worms in the stomach, had recently lost her vision and speech. The presence of worms in this case was indicated by a rapid movement of the tongue, like that of a serpent; and continual expiration by the nose, great anxiety, and copious perspiration of the head. The girl took an emetic, and brought up, with other matters, a round worm half a foot long; she then took purgatives, conjoined with anthelmintics, and very quickly recovered her sight and speech.

FABRE† mentions a certain Jean Barricot, who, ten days after he had been afflicted with the colic, lost the sight of both eyes, after being twice bled, and using a collyrium of rose water and the white of eggs without advantage. FABRE prescribed to the patient four grains of tartarized antimony, and two days afterwards, a draught made with half an ounce of senna, half a dram of the *pulvis e tribus*, and one ounce of manna; in two days more four grains, as before, of the tartarized antimony, and so for nine days following; afterwards some pills composed of calomel and scammony, an infusion of euphrasia, and the sudorific and laxative ptisan of the Paris pharmacopœia for eight days. The vapour of spirit of wine and coffee was applied externally, directed to the eyes by means of a funnel. On the 4th day of this treatment, Barricot began to distinguish the

* Journal de Med. de Paris. t. x.

† Ibidem. t. xx.

light from darkness; on the 12th day he could distinguish colours at a small distance; and by the 20th, recovered his sight entirely.

THILEN* relates two very interesting cases of *imperfect amaurosis*, cured by the use of the tartarized antimony, first as an emetic, and afterwards as an opening medicine, sometimes given alone, at other times conjoined with saponaceous substances and the extract of arnica.

WHYTT† mentions a woman, whose sight was greatly diminished whenever she had acidity of the stomach. She was relieved from this inconvenience by means of an emetic, some absorbent powders, and bitter stomachic corroborants. I know also a very respectable person, who happened frequently, before he was aware of the cause, to experience for some hours after dinner a great dimness of sight, approaching to a degree of blindness, in consequence of eating fish fried in olive oil. It is very remarkable that the *digitalis purpurea*, the *stramonium*, the infusion of tobacco, and many other similar articles, produce blindness almost as soon as they are taken into the stomach.

In the *French Mercury* for the year 1756‡, there is an account of a cure performed by FOURNIER, of several persons affected with *hemeralopia*. The first were three soldiers, to whom, after being bled, he gave an emetic. On the following day, as they yet complained of heaviness of the head

* Medicinische und chirurgische Bemerlkung. § *Amaurosis.*
† On Hypochondriacal and Hysterical Affections. Chap. I.
‡ Fevrier, page 168.

and nausea, he repeated the bleeding and emetic. By these means all the symptoms were removed, and the three soldiers were cured. FOURNIER employed the same method of treatment, with equal success, in eight other soldiers, belonging to the same garrison, attacked with this disease.

VIEUSSEUX mentions a child, who, after the scarlatina, from being suddenly exposed to the open air, was seized with total loss of sight accompanied with great dilatation of the pupil. The cure was effected by the use of the tartarized antimony and blisters, and finally by martial tonics. See Recueil Periodique de Med. t. vi.

PELLIER* cured the *hemeralopia* in the captain of the ship Micetti, with small doses of tartarized antimony, blisters to the neck, and cooling aperient ptisans. The same writer asserts†, that he had frequently cured the recent *imperfect amaurosis*, by small doses of tartarized antimony only (*émétique en lavage*), and by local aromatic fumigations.

To this series of facts, and many others which may be found recorded on this subject, not only by the ancient but by modern surgeons, I shall add some cases of my own, to prove in the most convincing manner the utility and efficacy of the method of treating the *recent imperfect amaurosis* here recommended, which, as I have already stated, is only an affection derived from sympathy with the stomach‡, depending upon morbific sti-

* Recueil de mem. et obs. sur l'œil, obs. 132.

† Ibidem, observ. 136. 138.

‡ Experientiæ suffragium firmum est, ut in omnibus capitis et nervorum morbis, sic etiam in iis qui oculos detinent, ven-

muli in the organ of digestion, with nervous debility, either general or confined to the eye.

It is to be remarked, that in the treatment of the recent *imperfect amaurosis*, both among the ancients and the greater part of the moderns, the general or partial evacuation of blood is very frequently and indiscriminately made to precede the use of an emetic or cathartic. Further observations on the treatment of this disease have taught us, that it is not to be regarded as a general rule, and that the abstraction of blood ought only to be employed in those cases, in which it is clearly indicated by particular circumstances; in those, for instance, which are accompanied with affections of the stomach, and at the same time plethora, either general, or confined to the head, in young and strong subjects, or in persons in whom the *amaurosis* has been produced or kept up by the suppression of some accustomed sanguineous evacuation. In other cases the abstraction of blood is not indicated; and in persons extenuated and affected with general nervous debility, afflicted with excessive grief, or where there is a disposition to convulsions, it may rather prove injurious.

So likewise with respect to the selection of remedies proper for unloading the stomach and intestines of the morbific *fomes*, and at the same time rousing the activity of the nervous system generally, it is worthy of remark, that, except in the case abovementioned, of persons who are very delicate and

triculi et virtuti ejus digestivæ rationem esse habendam. Hoffman, Dissert. de morbis *præcipuis recta medendi ratione*.

extenuated, whereas the tincture of rhubarb is more properly indicated, the *antimonium tartarizatum* as a vomit, or in divided doses as a resolvent, either alone or combined with gummy and saponaceous substances, so as to excite nausea, and gently open the bowels, is preferable to the drastic medicines, and acrid purging clysters, which were formerly in use. It is not improbable, that in the treatment of the recent *imperfect amaurosis*, produced by saburræ, and accompanied with suppression of perspiration, or by metastasis to the eyes, the *tartarized antimony* given in small and repeated doses is preferable to every other internal purgative, from its particular mode of action upon the stomach, and sympathetically upon the whole system; not only by expelling from the stomach and intestines the acrid bilious impurities, but by its peculiar stimulus, strengthening the activity of the nervous system, and restoring the perspiration and the action of the absorbent vessels.

In the chapter on *ophthalmia*, I have made mention of the increased morbid sensibility of the eyes, as a consequence of inflammation. It is proper here to call to mind, that this morbid sensibility is sometimes excited under circumstances widely different from the preceding. This affection takes place in persons who are advanced in years, that is, from 50 to 60, without any manifest cause, and after having enjoyed till then the most perfect sight. They begin to complain of objects appearing cloudy to them, especially at a distance, and that in a greater degree, as they are the more illuminated. By degrees the light becomes uneasy to them, and

in order to moderate it, they have recourse to coloured glasses. On examining the eye, there appears no defect, except that of an unusual contraction of the pupil, even in a very weak light, and of objects, when viewed at a short distance, appearing to them at first of a size less than natural.

This increase of sensibility in the eyes does not always arise from increased general sensibility; for it is not unfrequently observed even in persons who are robust, and in every respect healthy. The event, however, is different, inasmuch as in the weak, nervous, and hypochondriac, the increased morbid sensibility of the eyes is frequently the forerunner of *amaurosis*, whereas, in persons of a healthy constitution, the increased sensibility of the retina gradually diminishes, and the use of convex glasses alone is rendered necessary. I am satisfied from experience, that the internal and external corroborant remedies, which are useful in the first case in retarding at least the unfortunate termination of the disorder, are of no advantage in the second, and that in the latter, a proper regulation of diet, moderate exercise, the abstaining from reading, and the constant use of coloured glasses, are sufficient. Those who think that the uninterrupted use of green glasses is necessary to calm the excessive sensibility of the eyes are mistaken: quite the reverse happens; for after using them for some months, the patient is unable to bear even the most moderate degree of light, and is obliged to use glasses of a deeper colour than before, and even to require them in the house.

On the contrary, those who have the precaution to make use of glasses lightly coloured, and to defend the eyes only when they are exposed to the vivid rays of the sun, or the reflection from snow, in the course of a year or two are able to do without them, even in the strongest light, except that, in this condition, objects are seen much less distinctly than in a weak light, and always appear rather less than in reality, as long as the constriction of the pupil continues. I have often tried the extract of Belladonna, both internally and externally, as a medicine which has the power of diminishing the nervous excitement of the eye, and producing an enlargement of the pupil; but, independently of the eyes in these cases not bearing any stimulus externally applied, the effect of this remedy is temporary, and I have, therefore, never derived any permanent and considerable advantage from the use of it.

CASE LXV.

Giacomo Migliavacca, of Pavia, 32 years of age, by trade a carpenter, of a weak constitution and emaciated, towards the middle of March, 1798, after excessive grief, began to feel an obtuse pain in the eyebrow, general lassitude, tension of the abdomen, and loss of appetite. On the 7th of April following, three hours after rising out of bed, he suddenly lost the sight of both his eyes.

The next day he was admitted into the practical school of surgery. On examining his eyes, I found the pupils very much dilated and immoveable to

the strongest light, but regular in their circumference, and the bottom of the eye behind the pupil of a deep black colour.

I ordered the patient, without delay, two grains of tartarized antimony, dissolved in four ounces of water, to be taken by spoonsful at short intervals, until it produced nausea and vomiting. The patient having taken the whole of the solution, vomited at three times a very considerable quantity of mucus and of bilious greenish matter, so acrid, that, for some hours afterwards, he complained of an intolerable heat in the tongue and fauces. He had also, on the same day, two colliquative motions; he afterwards passed a good night, and the following day found himself relieved from the pain in the head and supercilium. I ordered him to take the opening powder, composed of one ounce of crystals of tartar and a grain of tartarized antimony, divided into six equal parts, one of which was taken three times a day, and continued for several successive days. The powder produced each time nausea, and one or two abundant evacuations from the bowels every day, with great relief, not only to his head, but his general constitution; for after the use of these opening powders for a few days, he ceased to complain of prostration of strength, and tension of the hypochondria. In the mean time I directed him to hold a small vessel, containing the aqua ammoniæ puræ near his eyes three times a day, until they should begin to water and become red.

During the first four days there was no sensible alteration in the patient's eyes; but on the fifth

day (18th of April) he said, that he could see the candle distinctly, which was brought near him. The pupils being then examined, I found them a little contracted. The opening powders were continued, but only twice a day.

On the 19th of April, the patient could sufficiently discern the surrounding objects in a moderate light. I found the pupils also more contracted than on the 13th, and as the patient had been hitherto kept on a low diet, and found his appetite returning, I allowed him the diet of convalescents. In order to strengthen his stomach and invigorate the nervous system, instead of the opening powders, I ordered him those composed of ℥j of the cinchona, and ℥ss of the valerian root, divided into six equal parts, of which he took one morning and evening, still continuing the use of the vapour of the caustic volatile alkali. From the 19th of April the patient's sight improved daily, and on the 22d of May he was discharged from the hospital in a state capable of following his business, which he also presently pursued.

CASE LXVI.

Stefano Barbieri, a pale weakly boy, 14 years of age, belonging to the hospital for orphans in this city, was attacked in March, 1797, with a peripneumony, for which he was freely bled. While he was recovering, he complained that he could scarcely discern any thing with the right eye, and that

he felt occasionally violent and deep pains in that eye, and the corresponding supercilium. Anti-spasmodics and tonics were prescribed for him; but without advantage, as the sight of the eye diminished daily; the pupil was contracted and had become immoveable, and a small whitish line presented itself beyond the pupil, which appeared to be an incipient opacity of the capsule of the crystalline lens.

He remained in this state two years, as his left eye served him sufficiently well; when, in the beginning of September, 1799, he was suddenly deprived of almost the entire sight of his left eye, with this peculiarity, that on his first waking in the morning, he could, with difficulty, distinguish light from darkness. Having examined him, I found the pupil of the left eye greatly dilated and immoveable, while, as I have said, the pupil of the right greatly worse, was immoveable and contracted.

I chose, in this case, to try the effect of the pulsatilla nigricans. I ordered the patient to take three grains of it morning and evening; I then increased it half a grain twice a day, until the boy took nine grains of it night and morning. At the end of fifteen days, I was obliged to omit this remedy, as it was attended with no advantage to the sight, and occasioned violent pains in the head, vertigo, and little less than general convulsions. I was content to let the patient remain quiet till the 24th of December of the same year, when I pursued the following plan of treatment.

I prescribed two grains of tartarized antimony dissolved in four ounces of water, of which the boy took a table spoonful every half hour. After he had taken about three parts of the medicine, he vomited half a bason full of greenish, bilious, tenacious matter, and towards night had two alvine evacuations. He passed a good night, and on awaking the following morning distinguished the objects near him, and the persons who passed through the ward; which he had not been able to do for some months before. I immediately put him upon the use of the opening powders, composed of ℥j of crystals of tartar, and gr. ij of tartarized antimony, divided into eight equal parts, of which he took three a day; these powders produced nausea and two evacuations regularly every day. The vapour of the caustic volatile alkali was used with the greatest diligence three or four times a day.

On the 1st of January, an hour after having taken the first opening powder, the boy vomited violently, and threw up a large quantity, as at first, of greenish viscid bilious matter. The medicine was suspended for that day, and was afterwards reduced to two doses only of the powder, one morning and evening, until the 8th of January.

At this time the boy could distinguish objects very well with the left eye, the pupil of which was less dilated than before, and shewed some mobility on being exposed to a strong light. The pupil of the right eye remained, as at first, contracted and immoveable; and he could distinguish light from darkness. The patient had lost the sallow livid

appearance of countenance which he had before, and felt a good appetite.

I had now recourse to SCHMUCKER's opening pills, of which the boy took four morning and evening, without omitting the frequent use of the vapour of the caustic volatile alkali. The pills produced nausea for a few minutes, and afterwards purged him twice a day, without occasioning debility.

On the 16th of January, he was seized with a diarrhœa, without any evident cause; it was therefore necessary to suspend the opening pills, which were, however, resumed on the 22d, but in half the dose; and as these also purged him too much, they were employed every second day, still continuing the use of the vapour of the aqua ammoniæ puræ.

On the 9th of February, the boy, finding the sight of his left eye tolerably re-established, left the house without leave, on a very rainy day, and returned completely wet from head to foot. This occasioned, two days afterwards, a continued fever of the remittent type, which was removed by the cinchona conjoined with valerian. The left eye, however, even in the strongest paroxysms of the fever, retained its vigour.

On the 26th of February, I left the boy in a good state of health, both with respect to his general habit and the sight of the left eye, with which he could distinguish the smallest objects. The right eye remained as imperfect as at the commencement of the treatment.

CASE LXVII.

[illegible]ni, a carrier, about 30 years of age, a man of a [illegible] temperament and good habit of body, in [illegible], was seized one morning, as he was going out of church, with a weakness of sight in both his eyes, which progressively increased to such a degree, that in a few minutes he found himself completely blind.

Being brought to the hospital, his countenance appeared flushed, his pulse was hard and full, the conjunctiva was streaked with some blood-vessels, and the pupil dilated and immoveable; he complained of no inconvenience except the blindness.

Blood was taken from the arm, and afterwards fourteen leeches were applied to the temples and the anterior circumference of the neck, from which an abundant discharge of blood was obtained; the patient was at the same time ordered a proper diet, aqueous drinks, and a purgative. By these measures a diminution of the strength of the body generally was obtained, but no advantage with respect to the blindness.

The next day two sinapisms were applied to the feet, and a large blister to the neck, which were of no benefit. On the fourth day of the disease, he took, in small quantities, a pint of the decoction of arnica, and at night a pill made with the extract of arnica and the pulsatilla nigricans. But as these remedies, which were daily increased in dose, produced no advantage in the space of fifteen days,

although continued with diligence and exactness, recourse was had to SCHMUKER's pills.

At the end of six days, the patient experienced a small degree of relief from these pills, which gradually increased every day, and, at the space of twenty-seven days he recovered his sight perfectly, which remained good for two months; but afterwards relapsed in consequence of his indulging in indigestible food and spirituous liquors.

This second time, after having a small quantity of blood taken from him, he resumed the use of SCHMUKER's pills, and by those only, without any external application, except cold lotions to the eye, he recovered in the course of thirty-two days, and had no further relapse.

CASE LXVIII.

Giuseppe Antonio Gossi, of Stradella, 60 years old, of a lively and strong temperament, was attacked, towards the end of 1794, with an obstinate quartan fever, with which he was so afflicted for thirteen months, notwithstanding the means which were employed, that, on the final cessation of it, a good diet, during five months, was scarcely sufficient to put him in a tolerable state of health. At this time, his former strength not being yet perfectly re-established, he began to see black streaks before the left eye, which gradually increasing, in the space of fifteen days he was completely deprived of the power of seeing with that eye. Some medicines which were prescribed for him rendered his

sight a little better, but it was of short duration; and he continued sometimes losing almost entirely the sight of the eye, at other times regaining it so as to be able to walk without danger.

He passed several weeks in this state, alternately better and worse, and in the hope that nothing further would ensue, the right eye remaining sound, he was unwilling to submit to any further treatment; when suddenly the sight of the right eye also became so diminished, that in a few days he found himself reduced to the necessity of being conducted, in order to walk with safety.

All the remedies which are administered on these occasions being found ineffectual, and the patient reduced also to the greatest distress, by being deprived of the employment by which he gained a livelihood, he came on the 8th of June, 1796, to this city for relief.

On an attentive examination, the pupils were found exceedingly dilated and immoveable, and the bottom of the right eye, beyond the pupil, was very dim.

On account of the disorder, principally of the organs of digestion, increased by violent affections of the mind, with which the patient for some months had been extremely agitated, four grains of tartarized antimony dissolved in eight ounces of water were prescribed for him, of which a large table-spoonful was to be taken every two hours. The first dose of this solution excited only nausea. It was repeated the following day, and he had scarcely taken six spoonsful of it when he was seized with a violent vomiting, by which he threw

up a large quantity of very bitter yellowish-green mucus, and had two alvine evacuations.

On the 11th, I prescribed sixteen grains of the antimonium tartarizatum dissolved in twelve ounces of peppermint-water, with the addition of ʒss of the syrup of orange-peel; of which a spoonful or two was to be taken three times a day. He was also ordered to drink, now and then, in small quantities, during the day, an infusion of a dram of the folia arnicæ in a pint and a half of water. On the two first days, a few hours after having taken one or two spoonsful of the solution of tartarized antimony, he vomited more or less bile; but afterwards the medicine only excited nausea.

On the 14th, the black streaks which appeared before the left eye, began to be dissipated, and in a few days were entirely lost. The pupil of both eyes became a little moveable, and on the twelfth day from the commencement of the treatment, he was already able to distinguish very large objects.

The solution of the tartarized antimony was now omitted, and he was ordered Richter's opening pills, of which at first he took fifteen three times a day; afterwards eighteen, and lastly twenty-four, never omitting, however, the use of the infusion.

He had not taken the pills fifteen days before his sight was strong enough to enable him to walk without a guide; and in about six weeks, by the uninterrupted use of these pills, and the assistance of spectacles, which he used before he was affected with the *amaurosis*, he was able to read and write. On examining his eyes at this period, there was no appearance of disease, except that the sight was

rather less perfect in the left than in the right eye.

The pills produced only nausea occasionally, and regularly every day a loose motion. He was allowed to return home at his own request, upon condition that he would continue to take, at intervals, another entire dose of the pills. His sight was not afterwards subject to any alteration *.

CASE LXIX.

Giuseppa Pizzi, a girl 16 years of age, of Belgiojosa, of a delicate constitution, who had not yet menstruated, towards the end of May of this year, 1801, was affected with a morbid appetite, so distressing that she could scarcely satisfy herself by eating every kind of gross food in large quantity, especially bread made with Indian corn (zea mays). The girl being also fatigued by the hard labour of the country, to which she had not yet been sufficiently accustomed, perceived that her sight became dim. Her immoderate appetite suddenly ceased; she had a bitter taste, and began to feel a sense of weight in the region of the stomach, accompanied with nausea and continual head-ach; she then lost the sight of the right eye entirely, and in a great degree that of the left. The pupil of both eyes was exceedingly dilated, and almost immoveable to the strongest light, and she also appeared as if she had an incipient strabismus. In this state she was

* The progress and treatment of this disease is perfectly known to Volpi, a skilful and expert surgeon of this hospital.

brought into the practical school of surgery, on the 4th of June, 1801.

On the 4th of June, the girl took a table-spoonful of a solution of four grains of tartarized antimony in five ounces of distilled water, which occasioned great nausea for a long time; but she only vomited a little viscid whitish matter.

On the 5th, the emetic was repeated, and given in the same manner. It produced a more copious vomiting than on the preceding day; but still of whitish mucus. The pain in the head was, however, greatly diminished, as well as the sense of weight in the region of the stomach. The nausea, however, and furred tongue, still continued. The pupil appeared a little moveable to a very vivid light, and when the left eye was covered, the patient could distinguish whether it was light or dark. She began to use the vapour of the aqua ammoniæ puræ, which was repeated every two or three hours.

6th. Little pain in the head; the taste less bitter than on the preceding days; the pupil acquires some mobility. The opening powders are prescribed, of which the patient takes three in the day, and continues to apply the vapour of the caustic volatile alkali to the eyes every two or three hours.

7th. Very little pain in the head. The opening powders produce nausea for a few hours; afterwards two copious evacuations in the course of the day. The pupil is a little contracted, and the patient can distinguish the figures of large objects.

8th. The pain in the head is entirely gone, as well as the bitter taste and furred state of the

tongue. The pupil is more sensible to the impression of the light than on the preceding day.

9th, 10th, 11th, and 12th. The patient continues to take the opening powders, and to use the vapour of the caustic volatile alkali externally.

13th. The patient complains again of head-ach and bitter taste, and the tongue is furred. Instead of the opening powders, I ordered her an emetic, composed of half a dram of ipecacuanha, and one grain of tartarized antimony, to be taken at once. The patient vomited much yellowish-green matter. The head-ach immediately ceased, and the girl could then distinguish sufficiently well the objects that were presented to her. She continues the use of the vapour.

14th. She is very well. The pupil of the right eye, or of that most affected with *amaurosis*, is even more contracted than that of the left.

15th. The patient resumes the use of the opening powders, and continues to employ the vapour of the caustic volatile alkali externally.

16th. There is a gradual amendment. The patient can distinguish a small needle with the right eye.

17th, 18th, 19th, and 20th. The opening powders produce daily two abundant evacuations, without debilitating the patient. She has a good appetite and digestion.

21st. The use of the opening powders is omitted, and the decoction of cinchona with the infusion of valerian root, taken in doses of three ounces three times a day, substituted in place of them.

22d, 23d, 24th, 25th, 26th, and 27th. The girl can see the most minute objects as well with her left as her right eye. She acquires a healthy complexion; and the strabismus has almost entirely disappeared.

28th. She leaves the hospital perfectly cured. She is advised, however, to continue the use of the vapour for a week longer, and internally, morning and evening, a powder composed of a ℨj of the cinchona, and ℨss of valerian; and also to observe a regular diet, and to avoid the burning rays of the sun.

CHAP. XXI.

OF THE FUNGUS HÆMATODES, AND OF THE CARCINOMA OF THE EYE.

It has been for a long time an important inquiry among surgeons, why cancer, from which the rest of the body, in the early period of life, is exempt, attacks with such malignancy the eyeball during infancy, and that even more frequently than at an adult age. For it is a matter indisputable, that of twenty-four individuals affected with what is called *carcinoma* of the eye, twenty of those at least are children under 12 years of age. Mr. Wardrop* has lately afforded a solution of this question, by shewing from careful observation, founded on pathological anatomy, that the morbid change of structure of the eyeball in children, commonly called *carcinoma*, is not in reality produced by cancer, but by another species

* Observations on Fungus Hæmatodes, Edinburgh, 1809.

Hayes and J. Hunter, as far back as the year 1765, had observed and described this disease in the eyes of a child about three years of age. *Med. Observ. and Enquiries*, Vol. III. p. 120. A white, soft, fungous substance was found in the posterior chamber of the eye, which had pres ed the vitreous humor forwards. Mr. Hunter was inclined to consider this preternatural substance as a morbid change of structure in the vitreous humor, which he said had no connection with the retina. But [illegible] are now an extensive series of facts similar to this, invariably proving, in the most satisfactory manner, that this excrescence is from its commencement connected with a diseased state of the retina and optic nerve, one cannot avoid thinking, that there must have been some inaccuracy in the dissection made by him.

of malignant fungus, to which modern surgeons have given the name of *hæmatodes*, a disease indeed equally, and, with regard to the eye, more formidable and fatal than cancer, but distinguished from it by appropriate and peculiar characters, which, not being confined to age, sex, or part of the body, attacks the eye-ball both in infants and adults, but especially the former, under the form of common cancerous fungus.

The general comparative examination of the external appearances, and accurate investigation of the morbid internal structure of the parts affected by either of these diseases, but particularly with reference to the altered texture of the internal parts of the eyeball, and the concourse of symptoms peculiar to each of them, fully confirm this pathological truth.

Cancer is constantly preceded by schirrus, or by a state of morbid hardness, of some soft part of the animal body, whether glandular or otherwise. During the progress of the hard schirrous substance towards a further degree of disorganization, an ichorous fluid is formed within it contained in cells, which afterwards extends towards the external surface of the tumor, and corrodes the parts which invest it. The compact and apparently fibrous mass of the schirrus becomes then converted into a malignant fungous ulcer, of a livid or cineritious colour, the edges of which are everted, and irregularly excavated, from which is distilled a quantity of acrid and offensive sanies.

The schirrus which forms the base of the malignant fungus, instead of increasing in size, rather

diminishes. The fungus retains through its whole extent its original schirrous hardness, and after rising to a certain degree above the surface of the open cancer, is repressed and destroyed at different points by the same ulcerative process from which it originated. And if the livid fungous sore seem disposed to heal at any part, this appearance is but illusory, for, in a little time, these smooth points become subject anew to the ulcerative process.

The fungus *hæmatodes*, on the contrary, from its first appearance, is a soft, equally circumscribed, and to the touch, somewhat elastic swelling, which, on being compressed, gives apparently the sensation of a deep fluctuation. Its external surface, with the exception of some enlarged and tortuous veins, on the integuments covering it, retains for some time its natural colour; internally, it presents a preternatural, soft, pulpy * texture, similar to the spongy substance of the placenta, or the still softer substance of the cortical part of the brain, soluble in a great degree in warm water, and coagulable by acids and boiling. When the parts investing this pulpy substance give way, it becomes changed into a malignant reddish fungus, tinged here and there with yellow or black spots, which grows and enlarges rapidly without any part of it being repressed by the ulcerative process. Even in its greatest state of enlargement, it retains every where its former softness, and on the slightest injury gives way and bleeds freely; it finally contaminates the surrounding parts, and discharges an

* On this account it has been denominated by some, the *soft*, or *medullary cancer*.

ichor more fœtid than that of cancer, *resembling* rather that of putrid meat *.

So far the description applies to the disorder generally; but when this formidable malady attacks the internal parts of the eyeball, the following is the series of morbid phænomena. The disease is preceded by a diminution of sight and aversion to light, afterwards by amaurosis, with complete dilatation and immobility of the pupil, and by an appearance at the bottom of the eye resembling burnished iron; to these precursors succeed the fulness of the vessels of the conjunctiva, with deeply seated and constant pain in the eye. Besides this appearance of polished iron at the bottom of the eye, by degrees a yellowish or greenish irregular spot rises, similar to a small mass of coagulable lymph effused into it, which, to a person unacquainted with the disease, is taken for a partial opacity of the vitreous humor. This small mass of yellowish or greenish † substance, traversed by the blood-vessels proceeding from the *central* artery of the retina, gradually increases, and necessarily distends the fundus of the eye beyond its natural limits. To these phænomena is sometimes associated the *dropsy* of the eye, as in the case before described ‡.

The yellowish fungous substance progressively

* This disorder is considered by some as a modification of cancer. However this may be, it is certain that, independently of the softness of texture, there is, both pathologically and practically considered, a remarkable difference between the character of this disease and the cancer proceeding from scirrhus.

† Plate I. fig. 2, a. d. d.

‡ Chap. 18, page 419.

advances from that part towards the iris, and proceeds to occupy the posterior chamber of the aqueous humor. Not only the fundus, but the whole globe of the eye now enlarges and changes its figure, and the pain affecting it, as well as the whole head, especially the forehead and neck, are more intense than before, and particularly during the night. This mass of substance, evidently fungous, contained in the cavity of the eye, afterwards enters the anterior chamber of the aqueous humor, now become turbid from the effused yellowish fluid *. In consequence of its pressure, the cornea and adjoining part of the sclerotica become thin and ulcerate, and the soft mass protrudes through these membranes in the form of a lobular fungus, which in a short time increases and extends beyond the eyelids upon the cheek, discharging an ichorous, corroding, and extremely fœtid fluid. When the fungus protrudes from the sclerotic coat near to the cornea, it is found to be covered with the conjunctiva, which it presses strongly forwards. The pain becomes now intolerable. The part protruding from the eye-ball assumes a reddish colour, variegated with yellow or black spots; and preserves even in its greatest augmentation, its former softness of texture and consistence, and, on the slightest touch, gives way and bleeds profusely. When the fungous tumor has acquired its largest bulk, it never fails to give proofs of deleterious absorption, by which not only the parts near to it, but those remote, are contaminated, especially the lymphatic glands around the orbit, near the

* Plate I. fig. 3, d. c.

parotid gland, behind the angle of the jaw and in the neck.

If, at different periods from the commencement and growth of this disease, the eye be extirpated, in order to arrest it, and the parts removed be examined with a view to trace the nature of it, the primary origin of the malignant fungus is found to be in the retina, and particularly at the point of entrance of the optic nerve into the cavity of the eye *. For, on the first appearance of the yellowish or greenish spot, the retina on examination is found to be entirely deficient, or, in other words, to have degenerated into the malignant fungus. It is also found, that the *choroid membrane*, while the fungus *hæmatodes* is in its incipient state, does not appear to have suffered any remarkable alteration in its texture †, and that it is only at a more advanced period of the disease that this membrane becomes thickened and separated from its connection with the sclerotica. The choroid membrane, even in the most advanced stage of the disorder, preserves more than all others its natural texture. As the fungus *hæmatodes* advances from the bottom of the eye towards the cornea, the proper humors of the eye are dispersed by it, the cavities of which become finally completely occupied by the malignant excrescence, from which, when an incision is made in the eyeball, a small quantity only of pulpy caseous matter, tinged with blood, issues from it ‡. The portion of optic nerve, which is in continuity with the eye, is always in a morbid state from the earliest

* Plate I. fig. 2, a. d. d. † Plate I. fig. 2, i

‡ Plate I. fig. 3, d. c.

stage of the disease, but exhibits different appearances, being sometimes much thicker and harder than natural, and of a cineritious hue; at other times disorganized, soft, and of a black colour, and blended with the irregular mass which externally surrounds it.

The extirpation of the eye with the adjacent parts, even when the fungus *hæmatodes* is in its origin, or on the first appearance of the yellowish or greenish spot at the bottom of the eye, has been found by melancholy experience to be constantly unsuccessful, and the operation rather to accelerate than prevent the death of the patient. For in the course of a few months after the extirpation of the eye, however carefully executed, the fungous, soft, and malignant excrescence is invariably found to be reproduced at the bottom of the orbit, followed by wasting of the patient's strength, convulsive affections, slow fever, loss of the senses, and death. In the bodies of these unhappy subjects, mostly children, the morbid alteration of structure in the retina and optic nerve has been found to extend from the bottom of the orbit to the base of the brain, sometimes as far as the place of union of the two optic nerves*, at other times even as far as the corresponding thalamus, which has also in some subjects been converted into a shapeless pulpy mass, containing effused blood and ichorous matter. The meninges themselves contiguous to it frequently,

* When the diseased optic nerve was of a dark colour, and its disorganization extended beyond the place of union with its fellow, the two optic nerves were distinctly seen at this part not to decussate.

in consequence of the disease, exhibit red spots and tubercles, filled with viscid, ichorous fluid. In the Pathological Cabinet of this University, the head of a child is preserved, about 4 years of age, who was the victim of this dreadful disease, in which the optic nerve is seen from the orbital foramen as far as its junction [*aja quadrata*], with the opposite nerve converted into a tumor of the figure and size of an olive, the disorganized substance of which internally appears precisely similar to that of the malignant fungus which fills the orbit, and projects greatly beyond the eyelids. I do not undertake by this to prove, that the substance of the nerves is the principal seat of the disease, since it has not yet been ascertained, that the nerves, in other parts of the body where the fungus *hæmatodes* is met with, present the same morbid appearances. I only say, that constant observation teaches us that, with respect to the eye, the optic nerve and retina are the parts which in this organ are primarily affected by this disorder.

That which completes the frightful picture of the disease, as I before remarked, is, that the extirpation of the eye, even in the first stage of it, is equally as unsuccessful as when the fungus has forced its way out of it. Nor in all the annals of surgery is there as yet a well attested instance of the success of this operation for the cure of the disease now under consideration. Mr. Wardrop* states, that he performed the extirpation of the eye upon an infant, in which the disease, marked by the yellow colour at the bottom of the eye, had recently

* Case II.

made its appearance, and where the diseased organ, in the course of seven weeks from the first invasion of the disorder, had undergone no alteration in its form or size; yet the result of the operation was most unfortunate. This unquestionably shews, that, from the first appearance of the fungous mass at the bottom of the eye, the disease is already beyond the powers of art, in consequence, as it appears, of the optic nerve and parts investing it being infected and disorganized beyond the fundus of the orbit, and perhaps even as far as the base of the brain; consequently the operation, so far from being adequate to the radical extermination of the disease, rather contributes to its greater aggravation. When indeed the fungus *hæmatodes* takes place in one of the limbs, the fore-arm, for instance, although the tumor be small and recently formed, yet experience has frequently proved how difficult it is to determine its limits or the extent of its origin; under which uncertainty, it has frequently happened, that the extirpation of it has been unsuccessful, although performed at a considerable distance from the tumor, and it has been necessary in consequence to try amputation at the shoulder joint, as the only means of saving the patient, a thing impracticable beyond the fundus of the orbit. Pathological anatomy, which has contributed so much, especially of late years, to advance the progress of surgery, has only served in this instance to make us feel with deep regret the insufficiency of any means hitherto discovered to arrest the progress of this formidable malady. Although the *carcinoma* of the eye has always

been regarded, and deservedly, as one of the most serious and fatal evils to which this delicate organ is subject; yet, from what has been stated, it must be allowed that the cancer of the eye is less destructive than the fungus *hæmatodes*, and that for two important reasons. In the first place, because the *carcinoma* makes its first appearance on the exterior parts of the eye, so that whatever relates to the origin and formation of the disease, is open to observation. Secondly, because the cancerous fungus of the eye is very frequently, on its first appearance, not actually malignant, but becomes so in process of time, or from improper treatment, in consequence of which it assumes the real character of schirrus, and afterwards of phagedenic cancer, during which interval, the efficacious succours of art may be resorted to. Nor with regard to the two distinct stages of the *carcinoma* of the eye, that is, schirrus and cancer, can we, in my judgment, otherwise properly estimate the successful cures of what is called *cancer* of the eye, by the extirpation of this organ and the parts surrounding it within the orbit. For, if the circumstances are taken into examination, which have preceded and accompanied the successful result of the extirpation of the eye supposed to be cancerous, it is found, that the fungus had not originated from a malignant source, but evidently from some other morbid change of structure than that of schirrus. Such were those excrescences on the conjunctiva and anterior hemisphere of the eye, which have appeared in consequence of a staphyloma of the cornea, long exposed to the air

and to ulceration; those which have arisen from the conjunctiva having become relaxed from the long continued determination of humors to it; from ulceration of the cornea, neglected or improperly treated by the ligature or caustics; from violent ophthalmia not contagious, treated in the acute stage with astringent and irritating applications; those which have arisen in consequence of internal suppuration of the eye, with rupture of the cornea, and wasting of the eyeball; those, lastly, which were occasioned by blows or burns on the ball of the eye. Nothing, indeed, is more probable than that these ulcerated fungi were, on their first appearance, not of a malignant character, or certainly not *cancerous*, and that they had remained in that state to the time of the successful operation being performed.

It cannot be denied, however, that experience has too frequently taught us, that these fungous excrescences, arising from the conjunctiva and anterior parts of the eyeball, of an indolent benign character at their commencement, become, when left to themselves for a length of time, or empirically treated, in process of time, malignant and really cancerous. The art of surgery, unfortunately, possesses as yet no assemblage of pathognomonic symptoms, with the exception of one, which will be hereafter mentioned, by which the precise period of time at which the sarcoma of the eye changes from the benign ulcerated state of fungus to that of *carcinoma*. For the exquisite sensibility, darting pains, rapidity of growth, colour, and ichorous discharge, do not af-

ford a sufficient insight of the disease to enable us to form a just criterion of the cancerous nature of it. The only symptom, if not entirely pathognomonic, at least less uncertain than any other, as far as I have been able to deduce from repeated observation, is the almost cartilaginous hardness of the malignant ulcerated fungus, which induration is not met with in the benign fungus, and never fails to precede the formation of cancer. I have been led to this reflection respecting the diagnosis of the exterior fungus of the eye from the consideration of what happens in this as well as in other similar affections, especially in those excrescences which arise from the *mucous* membranes, and from benign wounds, which assume a malignant character. It is a thing very well known by surgeons, that the polypus of the nose and fauces, while it is soft, flexible, and colourless, constantly retains its benign character; but if from the bad constitution of the patient, or from harsh and injudicious treatment, the soft excrescence becomes very hard and assumes a deep red colour, with violent darting pains, which extend to the eyebrow, and bleeds on the slightest touch, the polypus is become malignant, and on the point of being cancerous. The same happens with regard to the fungus which originates in the maxillary sinus. And in both these cases, when the hard excrescence is laid hold of with the forceps in order to extirpate it, instead of its yielding and following the twisting of the instrument, from its rigidity, it breaks and presents at the rent part an

appearance of fibrous substance not very dissimilar to that of the glandular schirrus. The hard cancerous wharts of the glans penis were originally but soft fungous tubercles. This also happens in the *epulis* when it has become indurated. The *encanthis* likewise is converted into *carcinoma*, if, from being soft and flexible, it become rigid and cartilaginous, and afterwards ulcerates. The benign *pterygium*, which is soft and easily separable from the cornea and sclerotica, if it assume a coriaceous hardness of a dusky red colour, is quickly converted into an ulcerous malignant fungus. And it is immaterial as to the accuracy of the diagnosis, whether the morbid hardness of these parts be antecedent or subsequent to the appearance of the excrescence. The texture of the caruncula lachrymalis, and of the conjunctiva, does not differ essentially from that of the membrane which lines the nostrils, fauces, and maxillary sinuses; it cannot therefore appear surprising, that from the internal membranes of the eye, which has become wasted in consequence of violent internal suppuration with bursting of the cornea, fungous ulceration should arise as well as from the other membranes of similar texture. It would be therefore altogether an arbitrary exception to the general rule respecting the formation of cancer, and contradictory to experience, if it should be affirmed, that the *sarcoma* of the anterior hemisphere of the eye alone could be converted into *carcinoma*, without passing through the stage of induration; moreover it is proved by experience, that the specific character of every cancerous fungus, on whatever part of the body it may

be situated, is that of being a hard, fibrous, and incompressible mass, precisely as the hard schirrous substance from which it originated *.

The following cases will serve to throw some light on this very important subject, and be at the same time a guide under so much obscurity to determine nearly how far a confidence of success may be placed in the extirpation of the eye.

Pietro Campari, of Borgarello, aged 48, a husbandman, of an unhealthy constitution, subject to intermittent fever, and afflicted with chronic rheumatism, was suddenly attacked with pain in the left eye, which he attributed to the entrance of some extraneous body between the eyelids; which was not the case. A violent inflammation presently took place in the eye, succeeded by a total opacity of the cornea. Shortly afterwards, an excrescence of the size of a split bean arose from this opake membrane, surrounded by blood-vessels highly turgid. In the course of a fortnight, the sarcoma increased to such a degree, as to project beyond the edges of the eyelids. In this state the patient was brought into one of the wards of the hospital, where the excrescence was removed by means of the ligature, and afterwards the application of caustics and the ointment of Janin. The patient went out with the expectation of being cured; but a short time afterwards the sarcoma returned, and became larger than before, with an extensive base, which, however, was soft and flexible in every part of it. Darting

* In callous wounds the hardness is confined to their edges; in those which are *cancerous*, the fungous flesh feels equally hard in every part of them.

pains, extending to the head, disturbed the patient night and day, notwithstanding the use of opium internally, and externally, of anodyne cataplasms. In order to remove the disease effectually, I considered the excision of the anterior hemisphere of the eyeball necessary. The operation was performed by the late Prof. JACOPI. With a knife similar to that of WENZEL, but rather longer, the eyeball was pierced transversely from one side to the other through the sclerotica, at the distance of three lines from its union with the cornea, by which the lower half of the circumference of the eyeball was divided; the other half above was removed by the curved scissors. A portion of the vitreous humor came away with the crystalline, but the greater part of it remained at the back part of the eye, and was further restrained by the prompt closure of the eyelids. During the first twenty-four hours the pain in the orbit was very acute, accompanied with smart fever. On the fifth day, the general and local symptoms abated, and a bloody purulent sanies began to be discharged from the orbit.

Six days afterwards, on the eyelids being opened, the fundus of the eyeball appeared shrunk, the circular incision contracted, and its edges granulated. From this period the healing of the wound went on regularly, and was completed in twenty days. More than four years have now elapsed without the patient having the most distant appearance of a return of the disorder.

Giovanna Gandini, a peasant girl, 14 years of age, of a weak and ill conformation of body, disfigured in the face by large scars from the confluent

small-pox, was attacked in the 6th year of her age with violent ophthalmia of the left eye, succeeded by complete opacity of the cornea, and afterwards *staphyloma* of that part. Eight years after the formation of the *staphyloma*, the eye was again affected with ophthalmia more violent and intractable than before, the ill consequence of which was to convert the anterior hemisphere of it into a reddish painful fungus, of a cancerous aspect, except that it was every where soft and yielding. The patient was received into the school of surgery on the 26th of November, 1814, and three days afterwards was subjected to the complete extirpation of the eye by Prof. Morigi. On the first day the patient was tormented with violent pain in the head, frequent vomiting, and fever, which were mitigated by the internal use of opium, and externally of emollient and anodyne cataplasms, and on the following day by bleeding. Suppuration commenced on the fifth day, and the febrile affection entirely ceased. On the eighth the suppuration was abundant, and of a good quality. The orbit was cleansed at intervals by a decoction of mallows and mel rosæ. From this time the tumefaction of the cyelids began promptly to subside, and the fundus of the orbit to granulate. The re-union of the divided external commissure of the eyelids was assisted by means of strips of adhesive plaster; a dossil spread with a liniment, composed of two drams of simple ointment, and fifteen grains of cerussa acetata, inserted between the edges of the eyelids, sufficed during the rest of the cure, which was completed in two months. A year and a half has now elapsed, and

the girl enjoys the most perfect health. On examining the eye immediately after the operation, the soft fungus was found to be confined to the conjunctiva, cornea, and a portion of the sclerotic coat anteriorly; and the fundus of the eye, sound in every respect as to its membranes, contained only a limpid fluid instead of the vitreous humor.

Fabricius Hildanus* mentions a person of distinction, addicted to intemperance, and afflicted with the chronic rheumatism, who, in 1580, was seized with violent ophthalmia in the right eye, accompanied with most acute pain in the head, sickness, fainting, and intense fever. The inflammation, he states, resisted for six weeks the most efficacious remedies, and terminated in the internal suppuration of the eyeball and bursting of the cornea, which put an end to his suffering. For fifteen years successively the patient was subject to a slight attack of ophthalmia in that eye. In 1593, having resumed his free mode of living, the return of the ophthalmia was most violent. The disease was also aggravated by the improper application of irritating remedies during the acute stage of the inflammation. In the course of six months from the last attack of ophthalmia, the conjunctiva, and the eye wasted and shrunk to the fundus of the orbit, were converted into a deep red fungus, which advanced so far as to project beyond the eyelids. The complete extirpation of the eyeball and the surrounding parts was executed as the only remedy for such a disease, which was crowned with the

* Oper. Omnia, Cent. I. Observ. I.

most perfect success. In the fungus was found a concretion of the size of a split bean. The morbid change of texture had not in reality extended to the fundus of the eyeball, and the success proves, that the excrescence, notwithstanding the appearances, was not actually cancerous.

FISCHER * has given us the following narration. A peasant, 36 years of age, of a bilious melancholic temperament, addicted to gross acid food and fermented liquors, who, in his youth, had had the scabies sicca, and had been subject to erysipelas, was attacked with acute inflammation, which, partly from neglect, and partly from improper treatment, occasioned opacity and the rupture of the cornea; and lastly, the conversion of the anterior hemisphere of the globe of the eye into a soft red excrescence, similar in form to a cauliflower, projecting beyond the eyelids. The extirpation of the eye was performed, as the only means of cure, and the operation had the most perfect success. The extirpated eye, as may be seen in the plate annexed to the history, was filled anteriorly with a large fungus divided into several lobes; posteriorly, as is evident from it, the eyeball, muscles, and optic nerve, were in a sound state.

KALTSCHMIED † mentions a man, 50 years of age, who, afflicted with violent inflammation of the left eye, unfortunately fell into the hands of an empiric, who undertook to cure it by means of irritating and astringent topics; under the use of

* Dissert. sistens tumorem oculi sinistri schirrosum malignum feliciter extirpatum. Erfordiæ, an. 1720.

† HALLER, Disput. Chirurg. T. i.

which, the disease increased, accompanied with most acute pain in the eye and head. After this, the diseased eye increased to double its natural size, and the cornea burst in several places; from these openings, a soft excrescence arose, which in a short time acquired the size of a filbert. The pain and agony continuing, the total extirpation of the eye was performed with complete success. From the drawing of the extirpated eye, it is clear that the posterior hemisphere of the eyeball, the muscles, and the optic nerve, were free from disease.

FLAJANI * relates, that a young man, 17 years of age, a farrier by trade, while hammering a piece of heated iron, was struck on the left eye by a large spark of fire, which produced acute inflammation and total loss of sight. In forty-six days after this accident, the eyeball was converted into an ulcerated unequal excrescence, as large as a small orange, but not hard. From the violent symptoms which accompanied the disease, the complete extirpation of the eye was regarded as the only means of cure; which was performed. The patient passed the first day in great pain, and at night was seized with rigors, which were the forerunners of a sharp fever. In order to relieve the excessive pain in the head, blood was taken from the foot, and a grain of opium was ordered. Part of the night was passed in delirium. In the morning he sweat copiously, and the fever was greatly abated. On the fifth day the dressing was renewed, and the suppuration was

* Collezione di Osserv. T. IV. Osserv. 37.

now established. The eyelids formed a circle, and the whole cavity of the orbit was full of pus. The fever gradually diminished, and on the twenty-fourth day ceased. The discharge of matter also decreased, and the cure was completed in sixty days*.

The author has omitted to describe in what state the parts of the extirpated eye were found. From the whole of the circumstances, however, and from the analogy between this and the cases before related, it is reasonable to believe, that the soft fungus was not malignant, and that its roots had not extended deeper than the anterior hemisphere of the eye. And this seems to me the more conformable to truth, not only from the successful result of the treatment, but from the account which the same author gives in the case which follows, of a fungus apparently similar to the preceding, because occasioned like it by external injury, but which was neglected and improperly treated for six months, in which he adds, that the extirpation was unsuccessful, on account of the disorganization having extended to the whole of the eyeball, *the surface of which was covered with hard and ulcerated warts*, and a quantity of dark coloured sanies gushed out from the bottom of the orbit. On examination, indeed, the zygoma was found carious, and the bones composing the orbit dark coloured.

From these facts, it appears to me sufficiently proved, that the successful result of the extirpation of the apparently cancerous eye ought to be refer-

* To these instances of fungus which are regarded as cancerous, but which really were not so, may be added the case related at the end of the 19th Chapter.

red to the circumstance of the fungus not having as yet assumed, at the time of the operation, the degree of really cartilaginous and schirrous hardness, which precedes and gives origin and development to the cancerous malignity. And also that in the cases above related, the benign fungus had not extended beyond the anterior hemisphere of the eye to the fundus of the orbit, nor to the surrounding parts, where consequently the excision was fortunately made in parts perfectly sound.

There can be no doubt, that these excrescences of the eye, like those similar to them in other parts of the body, are connected with an unhealthy predisposition in the patient, increased and put into action by some predominant vice of the habit, as a scrofulous, venereal, herpetic, and perhaps more than any other, arthritic affection; for in the greater number of persons who are subjected to the same causes, as violent inflammations, improperly treated in the acute stage with irritating and astringent applications, internal suppurations and ulcerations of the eye, enlargement of the caruncle and conjunctiva, and wasting of the eye, excrescences of a carcinomatous appearance, do not always take place on this organ; consequently we cannot regard such excrescences, in those cases in which they are formed, in a strict sense, as benign and innocuous. But, notwithstanding, it is equally true, that whoever, from their disagreeable aspect, their rapidity of growth, and the pain which they occasion, regards and judges them at first sight as carcinomatous, is under great error. Among these, however, must be excepted, the case in which the

fungous ulcer of the eye had originated from a cancerous wart on the skin of the eyelids, which had extended its malignant influence to the conjunctiva and anterior hemisphere of the eyeball; in which no doubt can be entertained of the cancerous tendency of the disease. In all the other instances in which the exterior fungus of the eye proceeds from the causes before enumerated, and preserves its original softness; although ulcerated, it is never perhaps, as far as I know, carcinomatous. FISCHER, in the case before cited, shews evidently the perplexity in which he was placed in endeavouring to determine the nature of the fungus of the eye, of which he undertook the treatment; as he says, that, strictly speaking, this excrescence was not *schirrus*, but *schirrous* *, and that as such, it might be *malignant*, but not *cancerous*; and he felt the difficulty in which he was placed the greater, in not pronouncing it definitively cancerous, as the degenerated substance was soft and similar to the cortical substance of the brain, an appearance which he knew to be in perfect opposition to the peculiar character of schirrus and cancer †.

* Loc. cit. page 10. Ecquid impedit quominus illum tumorem scirrhosum, non vero scirrhum absolute appellamus, quippe propalavit non ex parte glandulosa, sed membranacea.

Nec cum casu HYLDANI comparari potest; quandoquidem neque livor et color plumbeus in parte affecta, nec dolor auctus punctorius circa noctem ingravescens fuit observatus, sed tumor ille substantiam cerebri ex capite prolapsi æmulabatur.

† As far as regards only the hardness of the ulcerated excrescence, as a characteristic sign of its malignity, the fungus *hæmatodes*, which projects out of the eye, might, from a want of attention, be declared benign, because it is constantly soft, even in

These considerations lead, in my opinion, to the conclusion, that the least fallible diagnosis, with regard to the nature of the sarcoma which arises from the anterior hemisphere of the eyeball, is that which is drawn, in the first place, from the equable and general softness, or from the coriaceous schirrous hardness of all the parts of the excrescence, as well as from the absence or presence of the hard ulcerated warts, which render its surface irregular. In the second place, from the time which has elapsed from the appearance of the disease; from the general constitution of the patient; from the general morbid predisposition of the habit; from the particular kind of darting pains felt at intervals, extending to the eyebrow and neck, and which become particularly aggravated during the night; from the ichorous matter, of an offensive odour and colour altogether peculiar to that of cancer; from the hollows or ill-coloured excavations which heal and break out again at different parts by the process of ulceration; from a state of constant slow phlogosis and erethismus of the eyelids, and of the skin of the subjacent cheek.

Conformably to what has been stated, it appears to me, the surgeon ought not to be in doubt, under any circumstances, with regard to the advan-

its greatest state of enlargement; but this serious error will be avoided, if, in every case of fungus of the eye, the most accurate investigation be made in order to ascertain whether the morbid excrescence has arisen from the anterior hemisphere of the eyeball, or internally from the fundus of this organ, recollecting all the symptoms which precede and accompany the fungus *hæmatodes*, and distinguish it from the exterior fungus of the eyeball, whether benign or malignant.

tage or inutility of the partial or total extirpation of the eye, and the selection of internal remedies, calculated to correct [illegible] general [illegible] predisposition, whether scrofulous, rh[illegible]etic, or venereal. It is necessary, howe[illegible] repeat, that it is of the greatest importa[illegible]lose this opportunity when it offers; for, as I have stated, the fungus of the anterior hemisphere of the eye, though not actually malignant in its origin, may become such in the course of time, and sometimes, as I have observed, even in the course of six months, passing from the state of *softness* to that of *schirrous induration, with hard points*, and afterwards of carcinoma, contaminating the lymphatic glands behind the angle of the jaw and in the neck, and, finally, in this short period, rendering the bones of the orbit carious.

I do not enter into the difficult and abstruse question, as to the cancerous [illegible], and consequently, whether the cancer is a disease only local, or produced by a specific cancerous virus, dispersed through the whole frame. I do not hesitate to assert, however, that whenever absorption has taken place from the cancerous wound, the disease certainly becomes universal, and from the insufficiency of our means, whether pharmaceutical or chirurgical, incurable. Experience nevertheless teaches us, that there is a period in the course of this terrible malady, in which, notwithstanding the appearances, the malignant principle is not yet developed in it, whether this be universal or local, and consequently, that it is possible not only to arrest its progress, but also to cure it radically by means of the

operation; for the knowledge of which well augured opportunity, I have before laid down as a guide what has been the result of my own observation and experience.

In reducing what has been said to a few general precepts, the following corollaries, I think, may be drawn from them.

1. The fungus *hæmatodes*, formed within the eyeball, is a disease altogether distinct from the *carcinoma* which attacks the external parts of this organ; whether the first be regarded as a modification of the second or not.

2. The fungus *hæmatodes* attacks the internal part of the eyeball in children under 12 years of age more frequently than in adults.

3. The complete extirpation of the eye for the cure of the fungus *hæmatodes*, although performed on the first appearance of this disease under the form of yellowish spot, is useless, and rather accelerates the death of the patient.

4. The exterior fungous excrescence of the eye, commonly called *carcinoma*, on the contrary, makes its appearance on the conjunctiva and anterior hemisphere of the eye.

5. The exterior fungous excrescence of the eye, while it is *soft to the touch*, *flexible*, *and pulpy*, although accompanied with symptoms similar to those of *carcinoma*, is not actually so, nor does it become malignant and strictly cancerous, until after it has become *rigid*, *hard*, *coriaceous*, *warty*, and in every respect, schirrous.

6. The inveterate fungous excrescence, hard to the touch in all its parts, covered with ulcerous

warts, which has involved the whole of the eyeball, optic nerve, and surrounding parts, rendered the bones of the orbit carious, and contaminated the lymphatic glands behind the angle of the jaw and in the neck, is incurable.

7. The partial or total extirpation of the eye, on the contrary, is attended with success whenever the operation is performed before the fungous excrescence, exterior to the eye, has passed from the state of softness to that of schirrous, verrucous, and carcinomatous hardness.

With regard to this operation, and particularly with respect to the frequent want of success attending it, I may repeat what has been lately said on the subject of trepanning the cranium: that the unfavourable issue is, for the most part, not so much to be attributed to the operation itself, as to the insuperable magnitude of the disease which has given rise to it, and consequently to the improper application of it. If, indeed, we consider that, what is regarded as cancer of the eye in children, is strictly the fungus *hæmatodes*, for the cure of which, extirpation is always insufficient; and that in adults this operation is most frequently performed when the exterior excrescence of the eye has passed from the state of schirrus to that of ulcerated cancer, from the malignity of which all the parts within, and exterior to the orbit, have been already contaminated; the reasons are evident, why this operation, in the greater number of cases in which it has been practised, has been hitherto useless or dangerous. Now that we know, if I am not greatly

mistaken, the principal conditions which are requisite for the success of the operation, there is every reason to believe, that the successful result of the partial or total extirpation of the eye, on account of the fungus arising from the anterior hemisphere of this organ, will be more frequent than formerly, and that the operation will be ranked in the list of the most necessary and useful enterprises of surgery.

In order to render the operation as expeditious and as little painful to the patient as possible, it ought, like every other, to be conducted on anatomical principles. The surgeon, before preparing to extirpate the eye, should call to memory all the points and modes of union which connect the eyeball anteriorly to the eyelids and exterior margin of the orbit, and posteriorly to the bottom of that cavity, in order that the knife may be conducted with such regularity, that the eyeball may be loosened from all these connections with precision and speed. To the first order of these connecting parts belong, the conjunctiva, the elevator muscle of the upper eyelid, the superciliary and nasal nerve, with their corresponding arteries and veins, the tendons of the greater and lesser oblique muscles. In the second order are to be regarded the parts connecting it to the bottom of the orbit, viz. the origin of the recti muscles, of the elevator of the upper eyelid, and that of the greater oblique, the optic nerve, the trunk of the ophthalmic artery, and the parts entering the orbit by the sphœno-orbital fissure, that is, the ophthalmic branch

of the 5th pair, the 3d, 4th, and 6th nerves of the brain, and the principal confluence of the ophthalmic veins.

The patient being placed horizontally with his head somewhat raised, and the upper eyelid elevated by an assistant, the surgeon, with the fore and middle finger of one hand, should depress the sarcomatous tumor, and with it necessarily the globe of the eye and lower eyelid. Having, with a convex-edged bistoury, divided first the exterior commissure of the eyelids, if the tumor be very large, to the extent of five or six lines; he should perforate the conjunctiva at the external angle, and from thence, keeping the knife close to the upper plane of the orbit as far as the caruncula lachrymalis inclusively, should cut through the elevator muscle of the upper eyelid, the tendon of the greater oblique and the superciliary nerve. The elevator muscle of the upper eyelid may not have been included, if the knife has not been carried closely in contact with the vault of the orbit; in which case the surgeon will perceive it by insinuating the point of his finger under the upper arch of the orbit, and make a transverse division of it, together with the superciliary nerve, by turning the edge of the knife upwards against the superior plane of the orbit. After this, he should resume the incision along the inferior segment of the orbit, and previously raising the sarcoma and eyeball, and depressing the lower eyelid, should proceed from the external towards the internal angle; as, by so doing, the knife will penetrate between the lower margin of the orbit and the

lesser oblique muscle, while in descending from the internal towards the external angle, the instrument would pass between the eyeball and this muscle. The eye, freed from these attachments, and from that formed by the nasal branch of the ophthalmic nerve, will fall on the external side of the orbit, and will give the surgeon room on the internal side to pass his fore-finger as far as the bottom of the orbit to the origin of the muscles and entrance of the optic nerve, as well as the trunk of the ophthalmic artery. The finger will form a convenient guide for the introduction of the curved scissors to the bottom of the orbit, with which he will divide at one stroke the origin of the muscles of the eye, together with the optic nerve. Having done this, the operator should turn his finger gently round the fundus of the orbit, and towards the external side, in order the better to detach the parts adjacent to the eyeball, and bending it in the manner of a hook, should draw them a little towards him, while, with a second stroke of the scissors, he should divide all the parts which enter the orbit through the sphæno-orbital fissure; which will complete the operation. And, in order that no part may be left which might have been liable to contract the morbid disposition to be changed into malignant fungus, the surgeon should introduce his finger again along the internal parietes of the orbit, where he will easily distinguish the greater oblique muscle, which he will remove by means of the small hook and scissors. In the same manner he ought not to omit to remove the lachrymal gland, which he

will do with the greatest ease, on account of the previous division of the external commissure of the eyelids, if the fungus shall have been of large size. The orbit being cleansed from the grumous blood, should be filled with small dossils of soft lint, as high as its margin, upon which the eyelids should be applied, and over them a strip of lint spread with simple ointment, and a compress sustained by the *monoculus* bandage. The after-treatment, when suppuration has commenced, is to be conducted in the manner laid down in the preceding cases upon this subject.

It is surprising to see how nature by degrees is able to repair the deficiency in the cavity of the orbit with the addition of new substance. This new substance advances from all sides of the orbit, and is continued to the divided edges of the conjunctiva of both eyelids, terminating by forming a sort of smooth partition between the eyelids and fundus of the orbit. When this partition is formed a little beyond the eyelids, as happened in the girl who is the subject of the second case, an artificial eye may be used; but when this part is deeply situated in the orbit, as most frequently happens, the application of the artificial eye is difficult, insupportable to the patient, and does not answer the intended purpose. For, as the upper eyelid falls upon this part, and the artificial eye can only find a point of support in the fundus of the orbit, it necessarily requires that it should be made of a conical figure posteriorly, which is not easily done with the nicety requisite for its exact application. But in either

case the artificial eye is completely immoveable, and, in a great degree, covered and closed by the paralytic and falling eyelid, which gives a heavy look to the person wearing it, and occasions far greater deformity than when the eyelids are closed and covered by a black ribband, tied obliquely over the forehead.

ACCOUNT

OF A

CALCULOUS CONCRETION OF THE INTERNAL PART OF THE EYE.

AMONG the very considerable number of diseased eyes, which the friendly condescension of Dr. MONTEGGIA, a celebrated physician and surgeon of Milan, has afforded me an opportunity of examining, I have found one almost entirely transformed into a stony substance *.

This eye, taken from the body of an elderly woman, was about one-half the size of the sound one. The cornea was dusky, behind which the iris appeared of a singular figure, being concave, and without foramen or pupil in the middle. The rest of the eyeball, from the termination of the cornea backwards, felt unusually hard to the touch.

By making an incision, I found the sclerotica † and the choroidea ‡ nearly in a natural state, and a small quantity of limpid fluid issued from the anterior chamber of the aqueous humor. Beneath the choroid coat, there appeared two hard calculous *scutellæ*, united together by means of a compact membranous substance; one of which was situated posteriorly, the other anteriorly. The

* Plate II. fig. 8. † Plate II. a. a. ‡ Plate II. b.

former * occupied the bottom of the eye; the latter † the situation of the corpus ciliare and the crystalline lens.

Having made an incision through the compact membrane, which united the margins of the two calculous *scutellæ*, I found within this cavity, instead of the vitreous humor, some drops of a glutinous bloody fluid, and along the axis of it a small soft cylinder ‡, which, running anteriorly from the bottom of the eye along the greater axis of the ball, went to be implanted in an elastic cartilaginous substance, situated in the centre of the anterior cup-like body, precisely at the part, which, in a natural state, is occupied by the crystalline lens and its capsule; both of which parts were entirely wanting.

The posterior surface of the iris had contracted a firm adhesion with the middle part of this cartilaginous substance, situated in the centre of the anterior calculous *scutella*; consequently when the iris was viewed on the side next the cornea and anterior chamber of the aqueous humor, it appeared, as it was in reality, concave in the middle.

The optic nerve degenerated into a thread, passed through the sclerotic and choroid coats §, advanced through the centre or bottom of the posterior calculous *scutella*. and was lost in the small soft cylinder ||, which, as I have stated, went to be inserted in the cartilaginous substance, situated in the centre of the anterior of these calculous bodies, or at the part which is naturally occupied by the crys-

* Plate II. c. c. † Plate II. d. d. ‡ Plate II. f.
§ Plate II. e. || Plate II. f.

talline lens and its capsule. The greater part of this small cylinder, especially near the ciliary body, was apparently nothing more than the membrane of the vitreous humor emptied of its fluid, wasted, contracted, and converted into a compact substance. The same thing was observed in the dissection of the dropsical eye before mentioned *.

HALLER has met with a fact similar to this, and has given us the description of it, which, from its great resemblance to the one here detailed, is worthy of being related and confronted with it.

In furis cadavere, says he†, *quod an.* 1752, *dissecuimus, diritas quidem morbi non tanta, raritas autem etiam major fuit. Cum enim in eo homine nervos oculi solicite pararemus, cæcum fuisse eo latere, atque in cicatricem in cornea esse, et duritatem in oculo ipso adparuit. Cum dissectione defuncti essemus, adparuit mira mali causa. Choroideæ membranæ suberat, retinæ loco, lamina ossea, aut lapidea (nam fibras osseas nullas vidimus), cui ipsa choroidea adhærebat, ut alias retinæ solet concentrica, hemispherio cavo similis, nisi quod duplici lamina fieret, et in altero latere duobus quasi loculis excavaretur. Is quasi scyphus accurati rotundo foramine perforabatur, qua nervus opticus subit, ut eo magis induratam retinam esse adpareret.*

Intra hanc osseam caveam nullum vitreum legitimum corpus, sed nervum, quasi albam nempe cylindrum reperimus quæ per foramen ossei cyathi transmissa metiens ejus diametrum denique adhærebat osseo confuso corpori, quod potuisses pro corrupta lente

* Page 419.

† Observ. Patholog. *oper. min.* observ. 65.

crystallina habere. Ei corpori undique et iris, et processus ciliorum cognomines connascebantur, et cornea denique, ad quam iris pariter conferbuerat. Nunc sive retinam, ut ego persuadeor, sive quidquam aliud fuisse velis, quod in os cavum et hemisphæricum mutatum sit, in oculo tamen tenerrima parte corporis humani indurationem perfectam natam esse adparet; nihil ergo in corpore nostro dari, quod indurari nequeat. Lapillos aliquos in lente crystallina repertos fuisse legi; ejusmodi autem morbus, nescio an visus sit, qualem hæc opportunitas nobis obtulit.

Distinct mention is made of *calculous concretions of the internal part of the eye*, by F. D'HILDANUS *, LANCISI, as quoted by HEISTER †, MORGAGNI ‡, MORAND §, ZINN ||, and PELLIER ¶.

* Centur. I. observ. 1.

† Vindiciæ de cataracta, page 97.

‡ De sed. et caus. morb. Epist. 13. 9. Epist. 52. 30.

§ Mem. de l'Acad. R. de Sciences, an. 1780.

|| Hamburg, Magaz. *De retina ossificata*, 19. B.

¶ Recueil de mem. et obs. sur l'œil, obs. 239.

EXPLANATION

OF THE

PLATES.

PLATE I.

Fig. 1. *a*, *b*, The lachrymal sac.

c, The tendon or ligament of the *orbicularis* muscle of the eyelids.

d, The superior lachrymal punctum.

e, The inferior lachrymal punctum.

f, The caruncula lachrymalis.

g, A portion of the orbicularis palpebrarum which covered the lachrymal sac, separated in a great measure from the ligament *c*, and everted.

Fig. 2. *a*, Optic nerve apparently sound.

b, *b*, The sclerotica.

c, *c*, The choroid coat thinner than in a natural state.

d, *d*, The fungous mass interspersed with small blood-vessels into which the retina had degenerated. This fungous mass adhered to the optic nerve, and floated in the posterior chamber.

Fig. 3. *a*, The optic nerve harder than usual.
b, Lymphatic gland in a diseased state.
c, Portion of the sclerotica.
d, All the cavities of the eye filled with a fungous mass of unequal consistence, arising from the optic nerve and retina.

PLATE II.

Fig. 1. The eversion of the lower eyelid, occasioned by a shortening of the integuments, in consequence of an extensive cicatrix formed a little below it.

Fig. 2. The state of the lower eyelid (*fig.* 1.) after the operation. In consequence of the greater shortening of the integuments towards the temples than the nose, the lower eyelid is seen to be less elevated towards the external than the internal angle. It embraced the lower part of the eyeball, however, sufficiently to prevent the descent of the tears upon the cheek, and to correct the deformity.

Fig. 3. Two pterygia of different sizes upon the same eye, taken from a dead subject.
a, The larger pterygium situated upon the eyeball on the side next the nose.
b, The smaller pterygium on the side next the temples. The two lines, one

straight, the other semicircular, marked upon the pterygium *a*, denote the double direction, which ought to be given to the incision in the extirpation of the disease.

Fig. 4. Dissection of the conjunctiva of the eye (*fig.* 3.), which evidently proves, that the pterygium is nothing more than a morbid thickening of the fine lamina of this membrane, which naturally covers the external surface of the cornea.

Fig. 5. *a*, The nebula of the cornea.

b, The fasciculus of varicose blood-vessels of the conjunctiva, by which the nebula of the cornea is, as it were, nourished and kept up.

Fig. 6. *a*, Procidentia of the iris through a small ulcer of the cornea. In this figure is seen the whitish margin of the ulcer, the contracted and preternaturally displaced state of the pupil, and the oblong figure which it assumes in such cases.

Fig. 7. The state of the eye (*fig.* 6.) after the cure of the procidentia of the iris. The pupil in some degree recovers its natural figure.

Fig. 8. Calculous concretion of the internal part of the eye.

a, *a*, The sclerotica turned back.

b, A portion of the choroidea.

c, *c*, Calculous concretion in the form of a small cup or *scutella*, which occupied

the bottom of the eye precisely in the situation of the vitreous humor.

d, d, The other calculous concretion in the situation of the corpus ciliare.

e, The entrance of the optic nerve into the cavity of the eyeball through the centre of the calculous scutella *c, c.*

f, The soft funnel-shaped body, which extended from the bottom of the eye as far as the situation of the capsule of the crystalline lens.

Fig. 9. Staphyloma of the sclerotic and choroid coats situated at the bottom of the eye.

Fig. 10. Another staphyloma of the sclerotic and choroid coats similar to it.

Fig. 11, 12. Artificial pupil.

Fig. 13. Double incision in the iris for the formation of the artificial pupil.

PLATE III.

Fig. 1. An elevator for the upper eyelid.

Fig. 2. Crooked or probe scissors for the division of the integuments of the eyelids in cases of trichiasis, or of excessive relaxations of them.

Fig. 3. Small scissors very convenient for removing any portion of the internal part of the eyelids, or of the conjunctiva.

Fig. 4. Scissors curved upon the back, commonly called by the French *ciseaux à cuiller.*

Fig. 5, 6. Apparatus for cauterizing the os unguis and pituitary membrane which covers this bone on the side of the cavity of the nostril.

Fig. 7. Small knife for the division of the cornea.

Fig. 8, 9. Maunoir's scissors for the formation of the artificial pupil.

Fig. 10. A solid leaden tent, furnished with a small plate, for the purpose of compressing the external part of the lachrymal sac.

Fig. 11. The needle, with a curved point, for the depression of the cataract.

* The point of the instrument magnified.

Fig. 12. The same needle with a straight point.

Fig. 13. A small convex-edged bistoury, very useful in removing the fungosities of the internal surface of the eyelids, and encysted tumors of those parts.

Fig. 14. Style for conducting the tears.

THE END

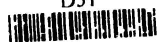
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